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Bureau of Land Management

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Eastern Interior

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Draft Resource Management Plan and
Environmental Impact Statement

Volume 2: Chapters 4-5

Eastern Interior Field Office, Alaska



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BLM Cover Photos:

1. Alpenglouw on the White Mountains, Beaver Creek Wild and Scenic River, Alaska.
2. Steele Creek Roadhouse, Fortymile Wild and Scenic River, Alaska.
3. Dall Sheep at mineral lick near Lime Peak, White Mountains National Recreation Area, Alaska.
4. Mining operation on Walker Fork in Fortymile mining district, Alaska.

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Eastern Interior

Draft Resource Management Plan and Environmental Impact Statement

Volume 2

Chapter 4: Environmental Consequences

Chapter 5: Consultation and Coordination

Prepared by the

U.S. Department of the Interior
Bureau of Land Management-Alaska
Eastern Interior Field Office

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Chapter 4. Environmental Consequences

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4.1. How to Read This Chapter

Chapter 4 presents the potential impacts to the natural and human environment in terms of environmental, social, and economic consequences that are projected to occur from implementing the alternatives presented in Chapter 2. Chapter 4 contains the following main sections:

- 4.2 Introduction
- 4.3 Impacts Common to all Subunits
- 4.4 Impacts Specific to the Fortymile Subunit
- 4.5 Impacts Specific to the Steese Subunit
- 4.6 Impacts Specific to the Upper Black River Subunit
- 4.7 Impacts Specific to the White Mountains Subunit

The Introduction section includes analysis assumptions, defines the types of effects that will be projected throughout the impact sections, and discusses the availability of data and BLM's cumulative effects analysis.

The section "Impacts Common to all Subunits" and the four sections describing impacts specific to each of the different subunits are broken down by resource or resource use. The order of these sections does not reflect their level of importance. In some instances, a discussion of the environmental consequences for a given subject may be addressed completely under a description of Impacts Common to All Alternatives, in which case there will be no further enumeration. Where there are impacts that vary between alternatives, these are broken down by alternative. Only those impacts that are applicable to that alternative are discussed; conversely, if there are no impacts to a given resource, there will generally be no heading or discussion for that subject.

During analysis, each resource specialist considered management activities resulting from the following programs: Air, Cave and Karst, Cultural and Paleontological, Fish and Aquatic Species, Non-Native Invasive Species, Soils, Special Status Species, Vegetative Communities, Visual Resource Management, Water, Wilderness Characteristics, Wildland Fire, Wildlife, Forest and Woodland Products, Lands and Realty, Renewable Energy, Minerals, Recreation, Travel Management, Special Designations (including Areas of Critical Environmental Concern and Wild and Scenic Rivers), Social and Economic Conditions, and Subsistence. If no impacts were identified the programs are not discussed further. In cases where impacts may potentially occur, the impacting resource or resource use is discussed in more detail.

Standard operating procedures resulting from federal laws, regulations, and policies would continue to be followed under all alternatives. These standard operating procedures constitute day-to-day implementation of policy and management, and may result in certain projects being mitigated, redesigned, or dropped from consideration. Since Required Operating Procedures (ROPs) and Fluid Mineral Leasing Stipulations have been included in Alternatives B, C, and D as design features, many impacts are reduced or eliminated up front.

4.2. Introduction

The following sections outline the assumptions for analysis and the types of effects analyzed.

4.2.1. Analytical Assumptions

Assumptions were made to facilitate the analysis of impacts. These assumptions set guidelines and provide reasonably foreseeable projected levels of development that would occur on BLM lands during the life of the plan. These assumptions should not be interpreted as constraining or redefining the management objectives and actions proposed for each alternative and described in Chapter 2.

4.2.1.1. General Assumptions

- Sufficient funding and personnel would be available to implement RMP decisions.
- Implementation of decisions would be in compliance with valid existing rights, federal regulations, BLM's policies, and other requirements.
- Facility and recreational developments would be maintained as appropriate.
- Discussion of impacts is based on best available knowledge. Knowledge of the planning area and professional judgment, based on observation and analysis of conditions and responses in similar areas, are used to predict environmental impacts where data is limited.
- Acreage figures and other numbers used in analysis are approximate projections for comparison and analytic purposes only. Acreage figures do not reflect exact measurements or precise calculations.
- State and Native entitlements would be met during the life of the plan. BLM lands would be reduced by 300,000 to 500,000 acres over the life of the plan, mostly in the Fortymile Subunit. State-selected lands in the Upper Black River Subunit would remain under BLM management.
- The life of the RMP would be 20 years.
- State-selected and Native-selected lands are segregated from mineral entry and would become available for mineral entry or leasing only when they either are conveyed or are returned upon rejection of land selection, and after the ANCSA 17(d)(1) withdrawals are revoked.

4.2.1.2. Resource Assumptions

4.2.1.2.1. Air

Air quality is pristine or nearly so, except for seasonal influences such as smoke, wind-blown dust, and arctic haze. Smoke from wildland fires would occasionally exceed EPA limits for airborne particulates. Despite these seasonal influences, the planning area is still considered an attainment area since it meets the standards of the Clean Air Act. It is assumed that there would be no non-attainment areas on BLM-managed lands during the life of the plan.

4.2.1.2.2. Climate Change

Climate change analyses are comprised of several factors, including greenhouse gases (GHGs), land use management practices, and the albedo effect. The tools necessary to quantify climatic impacts are presently unavailable. As a consequence, impact assessment of specific effects of anthropogenic activities cannot be determined. Additionally, specific levels of significance have not yet been established. Climate change analysis for the purpose of this document is limited to accounting and disclosing of factors that contribute to climate change. Qualitative and/or quantitative evaluation of potential contributing factors within the planning area are included where appropriate and practicable.

Based on climate change scenarios developed for the planning area (Rupp and Springsteen 2009b), expected changes include rising temperatures, decreased water availability, and increased wildland fire activity resulting in greater deciduous dominance on the landscape. Average annual temperatures are expected to rise above the freezing point by 2099 (an increase of about nine degrees F. from 1961-1990 historical averages). Average annual precipitation is expected to increase by thirty percent by 2099, but it would not be enough to offset increases in potential evapotranspiration, especially in the last half of this century. In spite of a shift in vegetation towards less flammable age classes and towards deciduous species, the simulation results indicate that there would be more frequent wildland fires, resulting in an overall increase in area burned annually. Climate change could result in changes in wildland fire frequency or severity.

Climate change would occur, with potential for significant changes in sub-Arctic vegetation over time. A change in climate could increased stress on native plants and may result in an increase in potential for the spread of invasive species. Warming would cause land cover changes in high latitude regions through both vegetation replacement and increasing frequency of disturbance, especially wildland fire.

4.2.1.2.3. Cultural and Paleontological Resources

The BLM would continue to mitigate impacts to significant cultural resources from authorized uses through avoidance and, if necessary, data recovery. New cultural resources would continue to be found and evaluated for eligibility to the National Register of Historic Places. Eligible cultural resources would continue to be treated similarly and equally in terms of type, composition, and importance, but many would continue to deteriorate through natural agents, unauthorized public use, and vandalism. The BLM would consult with Native and village corporations on traditional cultural properties and values that are of concern to them. The demand for uses of lands on which cultural resources occur could increase slightly.

The BLM would mitigate impacts to significant paleontological resources from authorized uses through avoidance and specimen recovery. Geologic formations with exposures containing vertebrate and non-vertebrate fossils would continue to be impacted from natural agents, unauthorized public use, and vandalism. The demand for use of both vertebrate and non-vertebrate fossils could increase slightly during the life of the plan.

4.2.1.2.4. Fish and Wildlife

Fish

Increases in human population and consumption would increase the demand on sport, subsistence, and commercial fisheries. International and national trends to protect and manage wild fish stocks would likely continue. The BLM would continue to manage and protect important spawning, rearing, overwintering, and migratory fish habitat. The BLM would cooperate with the ADF&G to preserve the genetic integrity of Alaska's wild stock of resident and anadromous fish populations. Improvements or protection of riparian habitats would indirectly improve or protect aquatic habitats and fisheries. Degradation of riparian habitats would indirectly degrade aquatic habitats and fisheries. Management opportunities for maintenance or improvement of fish habitat conditions would occur in Conservation and Restoration Watersheds. There is a direct correlation between the amount of quality habitat and fish populations.

Potential impacts to the quality of aquatic habitat would increase. Lifting of mineral withdrawals in some areas would result in increased mining activities. Placer mining within an active stream channel would adversely affect fish and fish habitat.

Some fish species, especially anadromous species, move seasonally or migrate between BLM lands and non-BLM lands, and impacts on fisheries populations may occur on non-BLM lands. All of the anadromous fish streams and the extent of anadromy have not yet been identified.

Wildlife

The BLM would minimize impacts to wildlife species. Wildlife habitats would remain in natural condition over most of the area. Effects of management actions on wildlife are often not predictable, and rarely quantifiable.

The size, diversity, and viability of species populations is dependent upon the quantity and quality of habitat. Habitat can be lost or impacted directly (e.g., vegetation removal) or indirectly (e.g., disturbance caused by human activity). Habitat requirements for any particular species cannot be met throughout the planning area, as species specific needs are often very site-specific. Habitat may be only seasonally available due to elevation, aspect, type of vegetation present, and proximity of human disturbance.

Habitat conditions will vary due to natural processes, even in the absence of human-caused changes. Climate change will result in increased stress on some species of wildlife. Habitat quality or availability may decrease for some species; other species may see an increase in availability of habitat due to changes in the vegetation associated with climate change. Management actions may benefit one species while having an adverse, or beneficial, impact on another.

Maintaining high quality habitat conditions can influence the severity of outbreaks of and subsequent losses from wildlife diseases, but the prevalence in the environment of various diseases cannot be fully controlled, particularly at chronic levels of occurrence.

Impacts on wildlife may also occur on non-BLM lands, particularly with migratory species. Population level impacts would affect the population regardless of whose land they are on. Conversion of BLM lands to private lands (conveyance) would increase hunting pressure on the remaining BLM lands. Development of non-BLM lands would increase, as would access on lands surrounding BLM lands.

4.2.1.2.5. Non-Native Invasive species

The number and type of non-native invasive plants would increase during the life of the plan, but would be concentrated around areas of human activity (e.g., trails, roads and mines). Increases in introduction and spread of non-native invasive plants may be accelerated by longer growing seasons (climate change). The demand for control of non-native invasive plants would increase as public knowledge of the economic and ecological detriments of these plants increases.

4.2.1.2.6. Soil Resources

Climate change would affect soils through changes in permafrost extent, soil temperature, and soil moisture, with subsequent changes in evapotranspiration, runoff, wildland fire frequency, and vegetation.

4.2.1.2.7. Special Status Species

The BLM-Alaska Sensitive Species List will change periodically. Although no threatened or endangered species currently occur in the planning area, additional species could be listed as threatened or endangered in the future. Inventory may identify additional Special Status Species on BLM lands, and will likely result in the expansion of known ranges and numbers of populations. Knowledge of the distribution and abundance of these species will grow, likely resulting in removal of some species from the list. Identification of new rare species from understudied species groups will likely occur.

National demand for the protection of species listed under the Endangered Species Act, as well as for species not yet listed but of concern, would likely increase. There are numerous BLM-Alaska sensitive species known or suspected to occur in the planning area. Demand for protection of these species would increase as inventory indicates specific habitat niches or requirements, and as increased visitor use or development places demands on associated habitats.

4.2.1.2.8. Visual Resources

Scenic resources would remain in demand from local residents who want to maintain scenic quality, local businesses that depend on tourism, and an increasing level of recreational users within the planning area. Increasing tourism would increase the value of scenic views, undeveloped landscapes, and open spaces.

4.2.1.2.9. Water Resources

Demand for water resources from the planning area's springs, streams, and aquifers would increase as a result of increasing recreation use, human population, and mineral exploration and development. Water quality and quantity could be impacted by several factors including increased evapotranspiration and thermokarst resulting from temperature increases. Water quality requirements would be achieved by the use of ROPs (Appendix A, *Required Operating Procedures and Fluid Mineral Leasing Stipulations*).

4.2.1.3. Resource Use Assumptions

4.2.1.3.1. Forest and Woodland Products

The trend to warmer, drier growing season conditions, would increase the proportion of beetle-killed trees, and could contribute to more severe wildland fires. A few (three to five) small biomass projects could occur during the life of the plan, most likely in the Fortymile Subunit. Large commercial timber sales would be unlikely. Forest product sales would be small- and the level similar to that which has occurred in the past; in the last 10 years, four permit for forest products have been authorized. Less than one-quarter acre would be disturbed per permit.

4.2.1.3.2. Lands and Realty Actions

Land conveyances to the State of Alaska and Native corporations would be completed. There would be a limited demand for land ownership adjustments to improve the manageability of federal and non-federal lands. Lands identified for disposal along the Alaska Highway that are

not conveyed, would be disposed of. Lands identified for acquisition in the Steese NCA would be acquired. Most federal mining claims would continue to be maintained as valid claims and would not be available for disposal.

There would be continued demand for land use authorizations such as rights-of-way, leases, and permits under all alternatives. Demand for use authorizations would fluctuate with economic growth and development, but would generally be low. Based on applications over the past five years, it is anticipated that no more than 30 applications would be received annually.

Withdrawal reviews would be completed within ten years of plan approval. All withdrawal recommendations would be completed. No new mining claims would be located on lands recommended for withdrawal.

4.2.1.3.3. Leasable Minerals

Coal

No coal development would occur on BLM lands, because a decision on leasing for coal is deferred. The RMP would need to be amended before coal leasing could be authorized.

Coal resource inventory and exploration (43 CFR 3480) could occur in the Eagle Field, in the Fortymile Subunit. Coal exploration activities would be minimal due to the lack of high potential coal lands and the lack of transportation infrastructure. Coal exploration includes drilling, excavating, and geological, geophysical or geochemical surveying operations. Exploration of coal requires an exploration license (43 CFR 3410). Each license would include requirements to protect the environment and associated natural resources, and ensure reclamation of the lands disturbed by exploration.

Coalbed Natural Gas, Geothermal, Non-Energy Leasable Minerals, and Oil Shale

No exploration or development of coalbed natural gas is anticipated. The only lands with potential for this resource have been explored and were not found to be economical.

No exploration or development of geothermal resources is anticipated. The only hot springs on BLM land is Big Windy Hot Springs, within the Steese NCA. It is not located near a population center or infrastructure, and is within a Research Natural Area.

No exploration or development of non-energy leasable minerals or oil shale is anticipated because of low occurrence of these types of minerals on BLM land.

Oil and Gas

In areas open to oil and gas leasing, leasing would not occur without further NEPA analysis. Interest from industry is expected to be limited for all subunits due to the lack of high potential areas on BLM lands. Seismic exploration could occur in the Steese or Black River subunits on high potential lands, but is unlikely during the life of the plan. The following assumptions apply to all action alternatives.

- Roadless exploration, in the form of seismic surveys, would occur after the tundra is frozen. Only approved low-impact tundra travel vehicles would be used. Field sampling and reconnaissance would occur in the summer using helicopter support.
- Approximately 130–212 2D or 3D seismic line miles would be shot every five years in the Yukon Flats Basin. Less than 20 miles of this would be on BLM land.
- Woody vegetation would be cleared on 14-foot wide survey lines using mechanized mulchers.
- Vibroseis would be the energy source used for seismic exploration. The vibrator pads would be mounted on trucks with low pressure tires.
- Seismic crews would be supported by ground vehicles and aircraft, and housed in a remote camp.
- If explosives are used, narrow profile, tracked drills would be used for drilling 20 to 60 foot deep, 3.5 inch diameter holes where explosive charges would be placed and detonated. The augered material would be placed back in the hole prior to detonation.

4.2.1.3.4. Locatable Minerals

Suction Dredge Operations

Suction dredging operations would occur with Notice Level operations. A crew of two would use a six-inch dredge operated by two, 11 horsepower motors. Processed materials flow directly back into the active channel. A single floating vessel would contain the pump used to recover gravel, the air source for the diver, and the sluice used to recover gold. The camp would be 0.2 acres in size. The number of Notice Level suction dredging operations expected under each alternative is outlined in the following table.

Table 4.1. Anticipated Number of Suction Dredging Operations

Subunit	Alternative (# suction dredging operations)			
	A	B	C	D
Fortymile	6	10	14	18
Steese	1	1	9	12
Upper Black River	0	0	0	0
White Mountains	0	0	0	0

Mineral Exploration Activities

Once mining claims are located, mineral exploration companies may establish a local camp and perform helicopter supported field sampling and mapping programs. If the exploration is successful, a drilling or trenching program would be conducted. Drilling would occur on temporary pads which are dismantled and removed after drilling is complete. Surface disturbance for drilling or trenching would be approximately two acres per year, which is completely reclaimed each year. Exploration projects would last for five years, resulting in a total of 10 acres surface disturbance. Disturbance from the camp would be approximately 0.4 acres.

It is assumed that over the life of the plan, one drilling program in the Steese Subunit may proceed to a mine pre-feasibility study where multiple drills are brought in. In this event, 10 acres would be disturbed per year over a five-year project life. The camp associated with a pre-feasibility would disturb up to 2.5 acres and helicopter use would increase to six hours per day.

Table 4.2. Anticipated Number of Mineral Exploration Operations

Subunit	Alternative (# mineral exploration operations)			
	A	B	C	D
Fortymile	0	0	2	3
Steese	1	1	9	12
Upper Black River	0	0	0	0
White Mountains (Livengood)	1	1	1	1

Small-Scale Placer Mining

On average, site surface impacts would be approximately 4.4 acres per placer operation, and would generally be Notice Level operations under 43 CFR 3809.13. If they occur in a WSR corridor, the Steese NCA, or an ACEC, they would then require a Plan of Operations under 43 CFR 3809.10. On average, an estimated one acre would be mined and one acre reclaimed each year. Approximately 4.4 acres would be continually disturbed for each operation. The life of each mine would be 10 to 20 years and a total of 20 to 30 acres would be disturbed during the life of the mine. Disturbance from the camp would be approximately 0.4 acres of the 4.4 acres.

Table 4.3. Anticipated Number of Small-Scale Placer Mining Operations

Subunit	Alternative (# small-scale placer mines)			
	A	B	C	D
Fortymile	27	31	33	34
Steese	7	8	15	24
Upper Black River	0	0	0	0
White Mountains (Livengood)	3	3	3	3

Large-Scale Placer Mining

On average, site surface impacts would be approximately five to 20 acres per placer mine and be subject to regulations found in 43 CFR 3809.10. Four acres would be mined and four acres reclaimed each year, with 16 acres continually disturbed for each project. A total of 60 to 80 acres would be disturbed and reclaimed during the life of the mine (10 to 20 years). Reclamation would occur before the bond is released.

Table 4.4. Anticipated Number of Large-Scale Placer Mining Operations

Subunit	Alternative (# large-scale placer mines)			
	A	B	C	D
Fortymile	2	3	3	3
Steese	2	2	4	4
Upper Black River	0	0	0	0
White Mountains (Livengood)	1	1	1	1

Large-Scale Lode Mines

Two lode mines may be developed on state or private land. These are described in section 4.2.4 Cumulative Effects.

4.2.1.3.5. Salable Minerals

Demand for gravel, rip-rap and other salable minerals would increase slightly as road maintenance and construction continue on state highways and BLM roads. Currently there are 11 active or pending material sites, totaling 160 acres of authorized disturbance. Existing material sites are located near existing roads, as the largest need for materials is road maintenance. Most of the BLM-provided materials are authorized under free-use permits to the ADOT or federal government, or as mandated under the TAPS authorization. These assumptions apply to all alternatives.

- No more than 200 acres of BLM land would be required to meet material demands over the next 20 years; 100 acres each in the Fortymile and White Mountains subunits.
- No new significant federal material sites are anticipated away from existing roads.
- Demand for material would generally be met from production on state lands.
- The future construction of a gas pipeline would increase demand for materials. This demand would mainly be met from state lands. The BLM could be directed to make materials available for pipeline construction; however, this is unlikely in the planning area due to the lack of BLM lands near the potential pipeline corridor.
- To date, sales out of the Eagle community gravel pit have accounted for the majority of the sales in the Fortymile Subunit. This is expected to continue.

4.2.1.3.6. Recreation

The demand for recreational use and recreational visits would increase by ten to fifteen percent over the life of the plan, due to general population increases and increases in recreation-related technology, leading to increased resource damage and conflicts among recreation users.

Anticipated increases would occur for both non-motorized and motorized activities. If recreation use levels or user/resource conflicts increase to the point that significant administration actions are needed, a recreation management plan would be developed to address the issues.

Special Recreation Management Areas would contain Recreation Management Zones (RMZs), each of which would be managed for specific activities, experiences, and benefits (Appendix H, *Recreation Management Zones*), in one of six prescribed recreation settings, described in Table 2.4, "Recreation Setting Decision Matrix for the Eastern Interior Planning Area".

4.2.1.3.7. Renewable Energy

Considering such factors as the amount and intensity of sunlight, wind velocity, proximity to roads and electric transmission facilities, and population size, no applications would be received to permit or lease commercial construction of solar or wind facilities on BLM lands under any alternative. The BLM may construct small solar or wind facilities to support BLM administrative sites and facilities. Biomass projects are addressed under section 4.2.1.3.1.

4.2.1.3.8. Travel Management

All Subunits

Demand for legal and physical access from all users would increase. Public easements reserved by Section 17(b) of ANCSA would become more important as Native corporation entitlements are met. Demand for roads and transportation rights-of-way would increase slightly. Road

development is contingent upon the economic viability of resource development, primarily minerals, and the needs of the State to plan and carry out transportation access.

The use of OHVs (including snowmobiles) for recreational and subsistence purposes would increase. Changes in OHV design and technology would continue, enabling OHV users to range into areas that were once thought to be inaccessible. Most impacts described in this analysis result from OHVs used during snow-free months. Where impacts are specific to snowmobiles, they are described as such.

Travel Management plans for the Fortymile and Steese subunits would begin within five years of the signing of the RODs. In these areas, summer OHV use would be limited to existing routes (Alternatives B and C) and size (all Alternatives) until the Travel Management Plan is developed.

Fortymile Subunit

Alternatives A and D: The Fortymile Subunit would see significant growth in travel-related land use and activity participation. Since OHV use accounts for the majority of travel-related activities, the demand for this activity would be of greatest concern. Given its current rate of user increase (about ten percent per year) use in the Fortymile is expected to double within the next 10 years. Existing routes would be repaired to sustainable standards and some new sustainable trails may be constructed. This would result in an increase in visibly affected ground area of about twenty-five percent over the next 10 years.

An increase in non-motorized modes of travel are also forecasted. An estimated 10 miles of sustainable, non-motorized trails would be constructed over the life of the RMP.

Alternatives B and C (Existing Routes): Based on an estimate that about twenty-five percent of use occurs off of the existing routes identified for these alternatives, use would initially decline by twenty to thirty percent and then grow at a rate of about five percent per year. Use would be double the current level in 20 years and then begin to stabilize. This would result in an increase in visibly affected ground area of about five percent over the next 10 years.

Steese Subunit

Alternatives A and D: The Steese NCA would see continued growth in travel-related land use and activity participation. Since OHV use accounts for a sizeable portion of travel-related activities in the Steese NCA, demand for this activity would continue to grow in the future. Existing routes would be repaired to sustainable standards and some new sustainable trails would be constructed. This would result in an increase in visibly affected ground area of about ten percent over the next 10 years.

The growth of non-motorized modes of travel are also forecasted. An estimated 20 miles of sustainable, non-motorized trails would be constructed over the life of the RMP.

Alternatives B and C (Existing Routes): Based on an estimate that about fifteen percent of use occurs off of the existing routes identified for these alternatives, use would initially decline by ten to twenty percent and then grow at a rate of about five percent per year. Use would be double the current level in 30 years and then begin to stabilize, resulting in an increase in visibly affected ground area of about five percent over the next 10 years.

Upper Black River Subunit

All Alternatives: With advances in recreational vehicle technology, this subunit could experience an increased level of land use and activity participation related to OHVs and access for subsistence use. However, this increase would be limited due to the features of topography, soils, vegetation, permafrost, lack of any defined trails, and the remoteness of the area.

White Mountains Subunit

Alternatives A and D: Trends and field observations show increasing use and demand for travel-related activities and access in the White Mountains NRA. Popularity of the White Mountains roads and trails, local population numbers, and OHV (including snowmobile) ownership are all currently on the rise. Use would continue to increase at current rates (five percent per year). Existing trails would be repaired to sustainable standards. An estimated 100 miles (five miles/year) of sustainable, multiple-use trails would be constructed over the life of the RMP. The ground area visibly affected by OHVs would increase by about twenty percent over the next 10 years.

The growth of non-motorized modes of travel are also forecasted. An estimated 80 miles (four miles/year) of sustainable non-motorized trails would be constructed.

Alternatives B and C (Designated Trails): Based on an estimate that about twenty percent of use occurs off the trails identified as “designated” for these alternatives, use would initially decline by at least twenty to thirty percent and then grow at a rate of about five percent per year. Use would be double the current level in 30 years and then begin to stabilize. The ground area visibly affected by off-highway vehicles would increase by about five percent over the next 10 years. Sustainable trails would be constructed at a rate of two miles per year (40 miles over the life of the RMP), and violations would increase.

4.2.1.4. Special Designation Assumptions

Areas designated as Areas of Critical Environmental Concern and Research Natural Areas would be managed to maintain the values for which they were designated. Eligible rivers would be managed to protect water quality, free-flowing nature, and Outstandingly Remarkable Values from the time the Draft RMP is published until a suitability decision is reached with the publication of the ROD. Rivers found to be suitable for designation as WSR in the ROD would be managed to protect water quality, free-flowing nature, and Outstandingly Remarkable Values until such time as Congress acts on proposed designation legislation.

4.2.1.5. Social and Economic Assumptions

Public Health and Safety

Public health and safety issues would receive priority consideration in the management of BLM lands. Hazmat and AML sites of concern would continue to be identified and cleaned up. The Tanacross Administrative and Airfield hazmat sites would be remediated.

The draft alternatives would not result in any public health impacts requiring impact analysis in this EIS.

Social and Economic

The population within the planning area will likely increase by ten to fifteen percent during the life of the plan, based on population trends since 1960. No change in borough status or boundaries is assumed. A large project (e.g., construction of a natural gas pipeline) would result in increased population growth in the region. Population trends, and increased recreational and subsistence demand trends, will influence social aspects of the planning area.

The economic impact analysis is based on changes resulting from proposed decisions in this RMP. Other factors that would affect the local economy, such as population growth, tourism trends, taxes, or resource extraction on other lands, are assumed to be the same for all alternatives.

The social groups defined in this RMP are to facilitate the discussion of social impacts. These groupings greatly simplify members' beliefs and values. For example, some miners engage in subsistence activities and are concerned about resource protection. Recreationists may engage in both motorized and non-motorized activities. The social impact analysis focuses on groups that have been identified as most likely to be affected by this plan.

The proximity of BLM lands to the small communities of Central, Chicken, Circle, Eagle, and Eagle Village suggests that effects may be more significant to these locations than communities located away from the public lands, or larger communities with more diverse social patterns and resource alternatives. However, impacts to affected groups at the local, state, and national levels have been considered.

Subsistence

The BLM would continue to play a major role in the management of subsistence resources on public lands. The demand for subsistence resources would increase. Competition for resources, especially those that receive high use from all resource users, would increase because more lands would be private and recreational use of BLM lands would increase.

As land conveyance to the State of Alaska and Native corporations is finalized, over selections would be relinquished. These lands would then fall under the Federal Subsistence Management Regulations instead of the state regulations. The acres of federal public lands, as defined for federal subsistence purposes, in the Upper Black River and Fortymile subunits, would increase.

The BLM would maintain a government-to-government relationship with federally recognized Tribes. Tribal members use Native, village corporation, and BLM-managed lands for traditional subsistence activities, and would continue to do so.

4.2.2. Types of Effects

Direct, indirect, and cumulative impacts are considered in effects analysis, consistent with direction provided in 40 CFR 1502.16. Direct impacts are caused by an action or by implementation of an alternative and occur at the same time and place as that action or implementation. Indirect impacts also result from an action or implementation of an alternative, but usually occur later in time or removed in distance from the action or implementation.

4.2.3. Incomplete or Unavailable Information

The best available information pertinent to the decisions to be made was used in development of this RMP. Data has been acquired from both BLM sources and outside sources. Some information was unavailable for use in developing this plan, usually because inventories have either not been conducted or are not complete (such as comprehensive trail inventories in the Steese, Fortymile, and Upper Black River subunits; subsistence use data for some communities; and, information on some populations of fish and wildlife). This is why some impacts are projected in qualitative terms or are described as unknown. Subsequent project-level analysis will provide the opportunity to examine site-specific data necessary to determine the appropriate application of the RMP decisions.

4.2.4. Cumulative Effects

Cumulative effects are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR Section 1508.7). Guidelines for cumulative effects analysis have been outlined and clarified in the Council on Environmental Quality’s (CEQ’s) Considering Cumulative Effects Under the National Environmental Policy Act (CEQ 1997b).

The cumulative effects analysis for this EIS incorporates the principles outlined by CEQ (CEQ 1997b) and BLM’s NEPA Handbook (H-1790-1). In this analysis the geographic scope and timeframes for past, present, and foreseeable future actions are described for federal and non-federal land uses and activities in the region of the planning area. Cumulative effects are analyzed for only those resources or issues that had direct or indirect impacts.

Geographic Scope: The Eastern Interior Planning Area (Map 1) is the general geographic scope for the cumulative effects analysis. Within this area, the BLM manages 6.7 million acres (twenty-two percent) of the land. In addition to this area, military lands occur immediately adjacent to the planning area, adding another 1.6 million acres. Geographic scope varies, and is further described in the respective subsections below.

Timeframe: A general timeframe for this analysis begins in the 1880s, when mining and community development became widespread in Interior Alaska, to 30 years in the future (2040). Forecasting beyond 30 years would be highly speculative. Specific timeframes for resources and issues will be discussed in the respective subsections below.

4.2.4.1. Activities Considered in the Cumulative Case

The following sections describe activities that were considered in the cumulative effects analysis.

4.2.4.2. Past and Present Land Use and Activities

Land Use

BLM Land: Past and current land use on BLM lands in the planning area (Map 1) are considered for this analysis. This information is described in detail in Chapter 3 of this EIS.

National Wildlife Refuges: The Yukon Flats and Tetlin National Wildlife Refuges (NWR) were established in 1980 by ANILCA. ANILCA also enlarged the Arctic NWR. The 28 million acres covered by these three refuges are managed to conserve fish and wildlife resources, fulfill international treaty obligations of the United States with respect to fish and wildlife resources and habitats, provide continued subsistence use, and ensure water quality and quantity within the region. Activities taking place on the refuges include hunting, fishing, recreational use, and subsistence harvest, as well as research and management activities. Oil and gas exploration has occurred on the Yukon Flats NWR (USFWS 2008a). Past seismic surveys have totaled about 514 miles. Approximately eight million acres of the Arctic NWR is designated Wilderness.

National Park Service Lands: The Yukon-Charley Rivers National Preserve was established in 1980 by ANILCA. The purpose of the 2.5 million-acre preserve is to protect and conserve natural and cultural resources to ensure that they can be used and enjoyed for future generations. There are no roads or settlements in the preserve, and the area is accessed primarily by boat, aircraft, or snow machine. The preserve includes approximately 5,100 acres of mining claims and a seven mile right-of-way for a state road to the Coal Creek mining area. Intermittent mining activity occurred from the 1880s through the 1970s. Since the establishment of the preserve, the lands have been managed primarily for conservation and wilderness values.

State Lands: The planning area includes nearly 11.4 million acres of state lands, and 1.4 million acres of BLM lands have been selected by the state. Most of the state lands in the planning area are managed under guidelines outlined in the Tanana Basin Area Management Plan (ADNR 1991), the Tanana State Forest Management Plan (ADNR 2001), and the Upper Yukon Area Plan (ADNR 2003), although some tracts have no management plan.

The state lands are managed for multiple use with priorities varying according to resource values for particular subunits. Primary land uses include forestry, agriculture, minerals management, recreation, fish and wildlife habitat, heritage resources, recreation and tourism, settlement, public access, transportation, and low-value resource management. Other management areas include the Chena River Recreation Area (ADNR 2003), and numerous recreation areas and public access sites.

Native Lands: Alaska Tribes received land selection rights through ANCSA. Approximately 2.9 million acres have been transferred to Native corporations, and an additional 1.1 million acres are selected. Doyon, Limited, is the major land holder in the planning area. Doyon, Limited's, management objectives include mineral development, oil and gas exploration, real estate, and tourism, as well as traditional uses, subsistence, and conservation. Native village corporations owning land include Stevens Village, Beaver, Birch Creek, Fort Yukon, Chalkyitsik, Dot Lake, Healy Lake, Eagle Village, Eagle, Northway, Tetlin, and Tanacross.

Past and Present Activities

Oil and Gas Leasing and Exploration: Oil and gas exploration has been conducted in the Steese and Upper Black River Subunits since 1954. Exploration has consisted of activities such as the airborne magnetometer studies, seismic surveys, well drilling, and borings. Three exploratory wells (Louisiana Land and Exploration Wells No. 1, 2, and 3) were drilled in the Kandik Basin in the Upper Black River Subunit in 1980. All three were abandoned as dry holes. Two shallow stratigraphic borings were drilled near Fort Yukon (USFWS 2008a). A coalbed natural gas test well revealed unfavorable results, as coal with only minor amounts of biogenic methane were encountered. Approximately 418 line miles of reconnaissance 2D seismic lines have been

conducted in the area (BLM 2009a). Some of these lines are still visible from the air. No development or production of oil and gas has occurred in the planning area.

Placer Mining: The first significant discovery of gold in the planning area was in 1887 on Franklin Creek, a tributary to the Fortymile River, and gold has been mined in the region continually since. There are 236 placer gold occurrences existing in the planning area. Of these 236 occurrences, 35 are active. There are 81 separate companies or individuals that are estimated to be producing gold in the planning area (Szumigala et al., 2008). Placer mining is occurring on both federal mining claims and state mining claims in the Fortymile, Steese, and White Mountains subunits.

Suction Dredging: Suction dredging is ongoing on state land. Over the past seven years the number of suction dredging operations permitted by the state has remained relatively constant, despite the price of gold increasing an average of \$100 per year for the same period. In 2008, there were 22 suction dredging operations in the planning area.

Lode Mining: The Pogo Mine, on state land in the Fortymile Subunit, has been in production since 2006. The mine has produced 373,000 ounces of gold (Szumigala et al., 2008), with three million ounces still in reserves. The underground mine is 38 miles northeast of Delta Junction, and is accessed by a 49-mile road from the Richardson Highway. Power is supplied via a 50-mile power line paralleling the road. The life of the mine is estimated to be 10 years (www.dnr.alaska.gov/mlw/mining/largemine/pogo). The total footprint of the mine is about 1,185 acres, including the road and powerline ROW. The mine site occupies 425 acres.

The Fort Knox Mine is an open-pit gold mine, located on state land 26 miles northeast of Fairbanks. It has been the largest producer of gold in Alaska since its commissioning in 1996. The mining claims encompass approximately 48,600 acres. As of the end of 2006, it has produced 2.7 million ounces of gold (Szumigala, et al., 2008).

The True North Project is located 11 miles from the Fort Knox Mine; the mining claims occupy 7,600 acres on state and private land. Ore from the True North Project has been hauled to the Fort Knox facility for processing. Total footprint for Fort Knox/True North is approximately 737 acres. As of the end of 2005, 530,000 ounces of gold were produced. The True North mine is not currently operating since its current reserve is depleted.

Development of Infrastructure for Communities: Although human settlements have existed in Alaska for thousands of years, it was not until the 1890s that permanent westernized communities began to be developed in the Interior. Fairbanks has been the largest community in the planning area since the early 1900s. The population of the greater Fairbanks area, including Ester, Fox, and North Pole, was estimated to be approximately 90,000 in 2008 and projected to be about 98,000 by 2018. Other communities in the region include Fort Yukon, Birch Creek, Beaver, Big Delta, Delta Junction, Circle, Central, Chalkyitsik, Chicken, Dot Lake, Healy Lake, Eagle Village, Eagle, Livengood, Northway, Tetlin, Tanacross, Tok, and Stevens Village. According to the 2000 census data approximately 4,800 people lived in these communities combined.

Major transportation routes include the Alaska, Richardson, Taylor, Steese, and Elliott highways. A line of the Alaska Railroad runs from Fairbanks to Eielson Air Force Base. The Trans-Alaska Pipeline System, constructed during the 1970s, runs along the edge of the planning area from the Yukon River to Delta Junction and through the Donnelly Training Area.

Military Activities: Army lands include Fort Wainwright, Tanana Flats Training Area, Yukon Training Area, and Donnelly Training Area. Eielson Air Force Base is situated 35 miles southwest

of Fairbanks, adjacent to Yukon Training Area. These areas have been used for military training since the 1940s. Fort Greely's 7,000 acres was transferred from the Army to the Space and Missile Defense Command in 2002. The Cold Regions Test Center is situated immediately to the south of Fort Greely. U.S. Army Alaska has experienced over one-hundred-twenty percent growth in assigned troop strength since 2003. Current levels are lower than historical levels during the 1950s and 1960s (U.S. Army Alaska 2004).

Research, Monitoring, and Land Management: Research, monitoring and land management are frequent activities on non-BLM lands in the study area. Specifically, fixed-wing aircraft and helicopters are used to transport personnel and equipment, and to conduct surveys. Remote areas are also accessed by boats during the summer and snow machine during winter to conduct research, monitoring and other land management activities.

Recreation and Subsistence: Recreational and subsistence use of fish, wildlife, and other natural resources are important aspects of the human interaction with the environment in Interior Alaska. Statewide, ADF&G provides users with more than one-half million fishing and hunting licenses each year. Between forty-eight and seventy percent of rural Alaska residents rely on subsistence or personal use harvest of wildlife; and seventy-five to ninety-eight percent utilize fisheries resources (ADF&G 2000). Demands on resources for recreation and subsistence could increase between ten and fifteen percent over the next 20 years.

4.2.4.3. Reasonably Foreseeable Future Land Use and Actions

Future Land Use

BLM: Alternative land use scenarios for BLM lands are discussed in Chapter 2 and analyzed in Chapter 4 of this EIS. Conveyance of lands to the State of Alaska and Native corporations is ongoing. On a statewide basis, ninety-eight percent of the Native conveyances and ninety-five percent of the state conveyances have been completed.

Yukon Flats National Wildlife Refuge: This analysis assumes no land exchange with Doyon, Limited, and that management of Yukon Flats NWR would continue as it has during recent decades. While oil and gas development is not reasonably foreseeable on the refuge lands, some exploration from Doyon, Limited, lands could be allowed on the NWR (USFWS 2010a). Wilderness characteristics would be preserved on approximately 8.5 million acres within the refuge under the Minimal Management Category.

Tetlin National Wildlife Refuge: A land use plan for the Tetlin NWR was completed in 2008 (USFWS 2008b). Future actions would include improved public access; and restoring fisheries management to maintain natural diversity based on historic distributions of fish. Wilderness characteristics would be preserved on approximately 564,000 acres or eighty-three percent of the refuge managed under the Minimal Management Category.

Arctic National Wildlife Refuge: The Arctic Refuge is currently revising their Comprehensive Conservation Plan. The alternatives in the Draft revised plan (USFWS 2011) recommend managing 10.8 million acres under the Minimal Management Category. An additional eight million acres is designated wilderness. Wilderness characteristics would be preserved on ninety-eight percent of refuge lands. The types of activities and management actions in the refuge would likely remain similar to the previous 30 years, particularly in that section that overlaps with the planning area. Disturbances of fish and wildlife habitats and populations would be minimized.

Opportunities for trapping, hunting, fishing, and other public uses would be maintained, as would scientific research and wildlife observation opportunities.

Yukon-Charley Rivers National Preserve: The types of activities and management actions in the preserve would likely remain similar to the previous 30 years. Demand for low impact use for recreation would probably increase proportionally with surrounding other federal and state lands. With a mandate to protect resources and ensure sustainability, impacts from resource uses are not likely to increase substantially. Demands for subsistence resources would remain relatively stable. Mining could occur in the future, because there are placer claims within the preserve. Access is limited, however, and large-scale or widespread mining activities in the preserve are not reasonably foreseeable. Wilderness characteristics would be preserved on 1.8 million acres determined suitable for wilderness designation.

Military Lands: The amount of military land in Interior Alaska is not likely to change within the next 30 years. Land use, however, would change with construction of new facilities at Fort Wainwright, Eielson AFB, the Space and Missile Defense Command at the former Fort Greely, and at the respective training areas (e.g., construction of the Battle Area Complex and associate facilities at Donnelly Training Area) (U.S. Army Alaska 2007).

State Lands: State lands would continue under multiple use management, with uses prioritized to conserve valuable resources in some areas while allowing resource use in other areas. As much as possible, state lands are managed so that uses are compatible with land use on adjoining federal lands. Land use for recreation, subsistence, and tourism would increase as local, state, and national populations grow.

Native Lands: Continued oil and gas exploration on Doyon, Limited, lands is likely, but any subsequent development would be speculative. An important aspect of Doyon, Limited's, mission is to develop resources. For example, Doyon, Limited, is seeking mining exploration on its lands, especially in the Fortymile Subunit where placer gold claims are encouraged and available, and mineral materials sales would continue (Doyon 2009).

Future Activities

Oil and Gas: No oil and gas leasing is anticipated during the life of the plan. Seismic exploration could occur on high potential areas within the Steese and Upper Black River Subunits under some alternatives.

Placer Mining and Suction Dredging: Placer mining, including large, small and suction dredge operations would continue to occur on state and Native corporation lands at the current rates. Placer gold production, statewide, doubled in response to an increase in gold prices in 2006. Since 2006 placer gold production has remained relatively flat (Szumigala et al., 2009). Increases in gold prices sparking increased interest in placer mining would be tempered by eventual depletion of the more accessible resources.

Lode Mining: The Pogo Mine has been in operation for three years and is expected to continue through 2016. Reclamation has been ongoing, and would continue concurrently with mining, and through closure of the mine and beyond.

Additional reserves remain at the Fort Knox Mine, and mining is expected to continue through 2018. Leasing could be extended for up to 55 years. Reclamation would occur after the operations have ceased, although reclamation of areas that will not be disturbed again is ongoing.

The deposit known as Money Knob could be developed into a large-scale lode mine during the life of the RMP. This resource contains an estimated gold resource of about 4,040,000 ounces. It lies on state and private lands about one mile north of the Elliott Highway. The mine would be an open pit. Access to the site is from the Elliott Highway. Mine roads currently exist. Total footprint of the mine would be approximately 680 acres (BLM 2009c).

The LWM prospective mine site is located 35 miles northwest of Chicken. This resource contains lead, zinc, copper, and silver. This site could be developed into a large-scale lode mine during the life of the RMP. The mine would not be located on BLM lands. Access to the mine would likely come from the Taylor Highway. The mine would be an open pit. Total footprint is approximately 540 acres (BLM 2009c).

Infrastructure and Communities: The population growth in Fairbanks and the Fairbanks North Star Borough is expected to be steady. Estimates in 2004 indicated growth from about 90,000 in the Borough to 98,000 in 2018. The number of people in rural areas including villages and small towns (except for Delta Junction and Big Delta) has declined, and these trends of growth in the larger communities and decline in the rural areas and villages will likely continue. No major new highway projects are planned in the region, but highway upgrades and maintenance would continue. The increased number of people would result in proportionally higher activity levels in the region.

Northern Rail Extension: On July 6, 2007, Alaska Railroad Corporation filed a petition to construct and operate 80 miles of new rail line from North Pole to Delta Junction. The proposed rail line would extend Alaska Railroad Corporation's existing freight and passenger rail service to the region south of North Pole (Surface Transportation Board 2008). The proposed route parallels the southwestern boundary of the Fortymile Subunit, between Fairbanks and Delta Junction. The majority of the proposed route is outside of the planning area.

Alaska Natural Gas Pipeline: Two natural gas pipeline projects are in the planning phases. One would consist of an instate gas line to transport North Slope natural gas to Anchorage. Two possible routes are being considered, one along the Trans-Alaska Pipeline System (TAPS) route to Fairbanks, then south along the Parks Highway to Anchorage. The second possible route would follow the TAPS route to Delta Junction and then go south through Glennallen to Anchorage. Another project under consideration is a pipeline to transport natural gas from the North Slope to markets in the Lower-48 states. This route would follow the TAPS route to Delta Junction and then the Alaska Highway and connect with existing pipelines in Alberta, Canada. Approximate length of the pipeline would be 1,700 miles (750 miles in Alaska). In addition to the pipelines, ancillary facilities such as compressor stations, temporary access roads, material sites, and construction camps would be needed online at <http://www.thealaskapipelineproject.com>.

National Park Service Lands: The types of activities and management actions in the Yukon-Charley Rivers National Preserve will likely remain similar to the previous 30 years. Primary activities will include research, monitoring, and management; subsistence; and recreation. At this time there are no plans to develop in the preserve or to create additional wilderness.

State Lands: Activities on state lands and for state-managed resources will continue and increase in proportion to population growth and tourism. The mission of the ADF&G is to manage fisheries to a sustained yield; conduct quality research; enhance fisheries; maintain and increase angler access; improve fish habitat; and provide information and education to the public (ADF&G 2010). Education, nongame management and research, and wildlife viewing opportunities

are expected to increase. Future actions will address human-wildlife conflicts, subsistence management, and predator management.

Military: Withdrawal of additional lands for military use is not expected, but use of land and airspace will intensify. The recent addition of the Stryker Brigade and Aviation Task Force to Fort Wainwright has increased intensity of use on Army training lands and airspace. Use of military operation areas (MOAs) over the planning area will continue to occur up to the levels allowed in the Final EIS for Alaska MOAs (USAF 1995). Air Force flight training would continue with increases in low-level flight activity (helicopters). Addition of the Aviation Task Force and Grow the Army initiatives will result in an addition of approximately 2,000 soldiers, staff, and family to Interior Alaska; while Eielson AFB will lose about 2,300 personnel and staff. Aviation flight training is also expected to increase on training lands in Interior Alaska (U.S. Army Alaska 2009).

Research, Monitoring, and Land Management: Research, monitoring and land management will continue on federal, state, and Native lands. Remote areas will continue to be accessed by fixed-wing aircraft, helicopters, boats, and snowmobiles, depending on season.

Subsistence and Recreation: Demands on resources for recreation and subsistence could increase between ten and fifteen percent over the next 20 years.

Climate Change

Climate change is occurring and affecting resources in the planning area. Temperatures have risen approximately 3.3 degrees F. since 1949 and by 2040 temperatures in the planning area may rise by as much as 4.6 degrees F. (Rupp and Springsteen 2009b). Annual precipitation is expected to increase by about three inches, an eighteen percent increase, by 2040. Evapotranspiration is also projected to increase by 2040 and water deficits would likely increase during peak growing season. If projected changes do occur, increased temperature and dryness would result in increased wildland fire activity, especially over the next 20 to 30 years (Rupp and Springsteen 2009b). Expected impacts to vegetation include an increase in deciduous and decrease in coniferous forest types. Changes in vegetation would result in subsequent alteration of wildlife habitat availability, for example, caribou habitat would be expected to decline by 2040, while moose habitat would likely increase.

4.2.4.4. Actions Not Considered in the Cumulative Case

Oil exploration and development could occur in the future on Doyon, Limited, lands within the Yukon Flats NWR, but is considered speculative. The USFWS chose the “No Land Exchange Alternative” in the Record of Decision for the Proposed Land Exchange (USFWS 2010b). This is why the Doyon Exchange was not considered in the cumulative case.

Birch Creek Village has identified a road to provide access from the village to the Elliott Highway as part of their Long Range Transportation Plan. The road would run through Victoria Creek in the White Mountains and would be 108 miles long. The Tribe has indicated that they will be applying for the necessary permits to construct the road. The proposed road is considered speculative at this point.

4.3. Impacts Common to All Subunits

4.3.1. Resources

4.3.1.1. Air and Atmospheric Values

4.3.1.1.1. Air Quality

Summary of Effects

Air quality management objectives and actions are the same for all subunits and alternatives. All authorized public land management activities would meet federal and ADEC air quality standards and regulations. Both prescribed and wildland fire would be managed to minimize degradation of air quality and be coordinated through the Alaska Interagency Fire Service.

Potential impacts on air quality include fugitive dust from roads and mineral operations, smoke from forest management and residential wood burning, and emissions from equipment and motorized vehicles, all of which could affect human health and air quality related values including visibility. The dominant air pollutant in the planning area is particulate matter from wildland fires. Regardless of alternative, large-scale stand-replacing wildland fires frequently result in substantial and uncontrollable air quality impacts.

As the planning area is sparsely populated with no industrial facilities, it is anticipated that no substantial anthropogenic air-quality pollutants would originate from the planning area during the life of the plan. Long-range atmospheric transport of emissions from other countries (Shaw 1995) occurs periodically, and this may also impair air quality and visibility.

Proposed management of the following resources, resource uses, or programs will have no anticipated effects on air quality for all alternatives and subunits, and will not be analyzed further: Cave and Karst Resources, Fish and Aquatic Species, Non-Native Invasive Species, Soil Resources, Special Status Species, Vegetative Communities, Visual Resources, Water Resources, Wilderness Characteristics, Wildlife, Special Designations, and Subsistence.

4.3.1.1.1.1. Effects Common to All Alternatives

The primary air quality goal under all alternatives is to comply with existing laws and regulations to meet health and safety requirements. Management objectives include minimizing degradation of air quality from wildland fire use and prescribed fire. All other authorized activities on public lands would meet Federal National Ambient Air Quality Standards (NAAQS) and ADEC air quality standards and regulations. These management objectives would be accomplished through specific management actions, including the use of ROPs (Appendix A, *Required Operating Procedures and Fluid Mineral Leasing Stipulations*) and considerations of air quality in Wildland Fire Situation Analysis, Wildland Fire Implementation Plans, and prescribed burn plans.

Surface-disturbing activities could directly affect air quality in the short-term by generating fugitive dust, smoke, or motor vehicle emissions. Due to the widely varied specific conditions, timing, and scale of these activities, reliable quantitative estimates of particulate emissions from these activities cannot be determined; however, implementation of resource protection measures,

permitting requirements, and emissions-control strategies, including established ROPs, to mitigate emissions would minimize impacts on air quality.

Effects from Wildland Fire Management

Impacts on air quality from wildland fire and its management activities include smoke and fugitive dust from roads and equipment, which could affect human health and visibility. The aerial extent of wildland fire smoke would vary depending on several factors including acreage burned, fuel type, and prevailing winds. The effects on air quality from smoke and dust caused by wildland fire management activities would vary from short-term and localized, for small wildland fires, to moderate term (weeks) and widespread for large wildland fires. Wildland fire suppression efforts would be coordinated through the Alaska Wildland Fire Coordination Group. One of the management objectives for air quality is the reduction of particulate emissions from uncontrolled wildland fires, primarily by fire suppression near communities.

Effects from Forest and Woodland Products

Impacts on air quality from small-scale forest products management activities would be minimal, but could include fugitive dust from use of roads and equipment (e.g., skidders and CATs), road construction, and smoke from slash-pile burning. The effects on air quality from emissions, smoke, and dust caused by the management activities typically would be short-term and localized. Smoke resulting from slash-pile burning would be mitigated by coordinating controlled burn activities with the Alaska Interagency Fire Service.

Under all alternatives, economically feasible access to forest product harvest areas on BLM-managed lands would continue to be very limited. Air quality impacts from forest and woodland product management are expected to be short-term, of low concentration, and of limited aerial extent.

Effects from Land and Realty

The construction activities authorized under ROWs or other land use permits (e.g., communication sites, transmission lines) produce emissions. Surface-disturbing activities such as bulldozing and travel on unpaved roads result in fugitive dust, and equipment and vehicle emissions.

Effects from Minerals: Leasable, Locatable, Salable

Minerals exploration and development activities have the potential to impact air quality. Lands would be open to oil and gas leasing, but leasing would not occur without further NEPA analysis. Interest from industry is expected to be limited for all subunits due to the lack of high-potential oil and gas resources on BLM lands. Seismic exploration could occur, but is unlikely. No solid leasable mineral development is anticipated. Impacts from mineral activities include fugitive dust from roads and emissions originating from equipment (e.g., seismic equipment).

Impacts on air quality from development of salable and locatable minerals activities are primarily fugitive dust from mining activities, roads, and emissions from equipment operations. Effects would typically be seasonal and localized.

Effects from Recreation

With increased pressures from growing populations and increased OHV popularity, the planning area could see significant growth in motorized recreation activity, particularly OHV use during

the life of this plan. The expected increased recreational activity has the potential for degradation of air quality from recreation vehicle emissions associated with high levels of use. Between mid-August and late-September, motorized travel increases significantly during the big game hunting season. Modes of motorized access to backcountry areas include small aircraft, motor boats, OHVs, and four-wheel drive vehicles. Large-scale group activities (such as the Tok to Dawson Poker-Run, with three events per winter and 100 to 200 snowmobiles per event), may have moderate short-term impacts on air quality-related values, such as visibility.

Effects from Travel Management

Expected air quality effects would typically be minor and localized for small groups. However, large-scale group activities (such as the Tok to Dawson Poker-Run, described above), may have moderate short-term impacts on air quality, including visibility. Other large-scale OHV group activities should be anticipated.

4.3.1.1.2. Climate Change

The net impact to climate change from any of the alternatives is not expected to be measurably discernible within the reasonably foreseeable future, primarily because of the expected low overall level of increase in BLM-authorized activities within the planning area. Several anthropogenic activities contribute to the phenomena of climate change, including emissions of GHGs (especially carbon dioxide and methane) from fossil fuel development, activities using combustion engines, land use changes, and subsequent changes to radiative forces and reflectivity (albedo). No substantial emissions of GHGs, fossil fuel development, or change in land use/land cover are projected to occur from BLM-authorized activities. Hence, although the specific nature of regional resource development impacts to climate change over the next decades are somewhat uncertain, it is reasonable to expect a relatively small increase in anthropogenic activity would result in a relatively minor contribution to climate change under all alternatives.

The BLM uses climate change projections to develop more informed long-term management guidelines and decisions for resource management plans and permitting activities. To better understand expected future wildland fire activity in the planning area, BLM commissioned the University of Alaska Fairbanks (UAF) to model likely vegetation and fire regime response to projected future climate changes in Interior Alaska. The UAF report (Rupp and Springsteen 2009b) is available online at <http://www.snap.uaf.edu/>. Highlights of the report are outlined below.

“Eastern Interior Alaska is projected to become warmer and drier over the next century. Warmer temperatures and a longer growing season are expected to increase evapotranspiration enough to outweigh a regional increase in precipitation. Seasonal changes in climate will have profound impacts on the condition and health of wildlife habitat, lead to increased wildland fire risk, and contribute to the likelihood of wetlands, streams, and lakes drying.”

Annual average temperatures are projected to increase over the coming decades at an average rate of about one degree F. per decade from the 1961-1990 historic 30-year average (about 24 degrees F.). Average annual temperature is expected to rise by about 6.4 degrees F. by 2049 and as much as 9.4 degrees F. by 2099. A likely outcome of these changes is a lengthening of the growing season (May through September), a change that could have profound effects on wildlife mating cycles, plant growth and flowering, water availability in soil and rivers, permafrost stability, and hunting and fishing.

Average annual precipitation (about 16 inches) is expected to increase to 19.6 inches by 2049 and to 21.1 inches (about thirty percent) by 2099, but it will not be enough to offset increases in potential evapotranspiration in the Eastern Interior, especially in the last half of this century. Winter precipitation may also increase by as much as fifty percent.

The model results of Rupp and Springsteen (2009b) are based on the A1B carbon dioxide emissions scenario (IPCC 2000), and assume a steady increase in carbon dioxide emissions from fossil fuel combustion over the first several decades of the 21st century, followed by a gradual decline in emissions as several kinds of low-emission energy alternatives become more prevalent. Their climate projections are in broad agreement with other global climate model results for Alaska (Chapman and Walsh 2007).

Projected changes in air temperature, precipitation, wildland fire frequency, and vegetation would be similar for all subunits and all alternatives. Impacts on specific BLM programs (resources, resource use) are discussed under each resource in section 4.3 Impacts Common to All Subunits.

For the purpose of this plan the net contribution to atmospheric carbon from effects of climate change and authorized BLM activities is expected to be minimal. Increased wildland fire frequency and to a lesser extent, thawing permafrost, would likely contribute carbon but increased temperatures, length of growing season, and expanded growth of forests in former permafrost rich areas would all act as carbon sinks. Overall, the cumulative carbon footprint of BLM-authorized activities is expected to be negligible because of the low level of expected activities and ongoing reclamation of disturbed areas. Release of carbon from thawing of permafrost soils remains a concern. However, Schurr et al., (2009) found areas that thawed over the past 15 years had more annual losses of old carbon than minimally thawed areas, but had overall net ecosystem carbon uptake as increased plant growth offset these losses.

Much of the science community regards rising carbon dioxide as the largest forcing agent on climate for the next 100 years (IPCC 2007a, IPCC 2007b, Volk 2008). There are other processes that may impact climate of the planning area, including sunspot activity, atmospheric particulate matter (dust), and regional ocean-atmosphere cycles.

4.3.1.1.3. Cumulative Effects

Historically, smoke from wildland fire has been the primary source affecting air quality in the planning area and the poorest air quality conditions have been reported during summer, normally May through August. Otherwise pristine air conditions are typical although occasional atmospheric conditions (inversions) can trap vehicle emissions and particulates from burning wood or oil for heating during winter.

Wildland fire is generally allowed to function in its natural ecological role with wildland fire suppression activities undertaken only to protect life and property, site-specific values, or adjacent higher priority management areas. Other major land owner groups (Native, state, and federal) recognize wildland fire as an essential ecological process and natural agent of change in ecosystems. To better understand expected future wildland fire activity in the planning area, the BLM commissioned the University of Alaska Fairbanks to identify vegetation and fire regime response to projected future climate changes in Interior Alaska (Rupp and Springsteen 2009b). Their simulation results show a general increase in wildland fire activity through the end of this century in response to projected warming temperatures and less available moisture and suggest that boreal forest vegetation will change from a spruce dominated landscape to a more

deciduous-dominated landscape. Changes in the projected cumulative area burned suggest that over the next 30-40 years the planning area will experience a rapid increase in wildland fire activity and change in vegetation (Rupp and Springsteen 2009b).

In spite of the shift in vegetation towards less flammable younger age stands and deciduous species, the simulation results indicate that there will be more frequent wildland fires, resulting in an overall increase in area burned annually. Increased wildland fires, over the next 20 to 30 years in particular, are likely to have substantial adverse air quality impacts. The Fire Management Program would adapt management activities as needed in response to changes in climate over the life of the RMP. Current trends in automobile and OHV technology are towards reducing emissions. Thus, although OHV use is projected to increase by ten to twenty-five percent, cumulative impacts to air quality from OHV travel is not expected to be measurable. Similarly, mining activity is projected to moderately increase, but the associated impacts to air quality from current and past activity have been negligible. New operations would likely employ equipment with improved emissions. Cumulative air quality impacts from mining equipment and OHV emissions are not expected to exceed NAAQS and ADEC air quality standards and regulations.

As the planning area is sparsely populated with no past, current, or planned industrial facilities, it is anticipated that no substantial anthropogenic air-quality pollutants would originate from the planning area during the life of the plan. However, long-range atmospheric transport of emissions from other countries (Shaw 1995) occurs periodically and may impair air quality and visibility. Cumulative air quality impacts from resource management programs and activities are not expected to be significant.

4.3.1.2. Cave and Karst Resources

Summary of Effects

Impacts to the cave and karst features are expected to be negligible. The significant caves are difficult to access because of their remote locations. Extremely sensitive or fragile resources were not identified during cave inventories. The recreation settings, special area designations, and travel management prescriptions for lands surrounding significant caves would help protect cave and karst features, as would active management of cave and karst resources.

Proposed management of the following resources, resource uses, or programs would have no anticipated effects on cave and karst resources for all alternatives and subunits, will not be analyzed further: Air and Atmospheric Values, Fish and Aquatic Species, Non-Native Invasive Species, Soil Resources, Special Status Species, Vegetative Communities, Visual Resources, Water Resources, Wilderness Characteristics, Wildlife, Forest and Woodland Products, Lands and Realty, Minerals Management, Renewable Energy, and Subsistence.

4.3.1.2.1. Effects Common to All Alternatives

Effects from Cave and Karst Resources

Nationally, management of cave and karst resources has trended toward more regulation to protect sensitive resource values. Additional protection could occur if sensitive resource values were discovered. Although, these protections would generally not be needed because the current and proposed land designations and management provide sufficient layers of protection. Actively managing to protect cave resources would have a minor beneficial effect.

Effects from Cultural and Paleontological Resources

Cultural and paleontological resources are often associated with caves. During cave inventories, no archaeological remains and only a few paleontological remains were found. The potential exists for additional cultural sites and paleontological resources to be found associated with caves, but it is thought to be unlikely. The lack of discovery does not preclude a future chance of discovery; and the occurrence of paleontological or cultural resources would initiate the protocols for determining if the cave qualifies as a “Significant Cave.” Management of cultural and paleontological resources would be beneficial and complementary to cave management.

Effects from Recreation and Travel Management

Possible direct impacts include the removal of cultural or paleontological resources or vandalism. Managing the cave and karst areas for a Primitive to Backcountry ROS setting, as in the Steese and White Mountains subunits, would provide additional protection to these areas. Known cave and karst areas would be managed for minimal trails and facilities, and access would continue to be limited OHV designations. These decisions would likely limit increases in visitation, reducing the potential for damage or vandalism. Effects would be low because of the low number of visitors to the area and because these areas are remote and difficult to access regardless of the OHV designations.

Effects from Special Designations

The significant caves in the White Mountains Subunit are located within Limestone Jags RNA under all alternatives. Caves in the Steese and Upper Black River Subunit are within a proposed ACEC under Alternatives B, C, and D. Designation as an ACEC could potentially confer additional protections on the cave and karst areas. However, this effect would likely be minimal as the remote location of the caves, other proposed management for these areas, and existing designations (e.g., Steese NCA and White Mountains NRA) provide sufficient protection.

4.3.1.3. Cultural and Paleontological Resources

Summary of Effects

Proposed management of the following resources, resource uses, or programs will have no anticipated effects on cultural and paleontological resources for all alternatives and subunits, and will not be analyzed further: Air and Atmospheric Values, Cave and Karst Resources, Fish and Aquatic Species, Non-Native Invasive Species, Soil Resources, Special Status Species, Vegetative Communities, Visual Resources, Water Resources, Wilderness Characteristics, Wildlife, Renewable Energy, Special Designations, and Subsistence.

There are several categories of cultural resources, including historic and prehistoric archaeological sites, Traditional Cultural Properties, and Native American Sacred Sites. The latter two may or may not have physical manifestations. No Traditional Cultural Properties or Sacred Sites are known in the planning area, nor were any identified during the scoping for this plan. Only those resource uses or programs that can directly or indirectly impact physical objects or arrangements of cultural and paleontological items will be analyzed in this EIS.

Surface and subsurface disturbances can directly and adversely impact archaeological and paleontological sites. Such disturbances can permanently disturb/destroy the fossils, artifacts, features, and architecture found at sites, or else destroy the spatial relationships among

them. Any activity that alters or destroys the objects or spatial relationships in a cultural or paleontological site consequently destroys our ability to interpret and understand the past. A variety of resources, resource uses, or programs outlined in this plan have the potential to result in surface and subsurface-disturbing activities, and thus may directly and adversely impact cultural and paleontological sites, regardless of subunit and alternative considered. These include Fire Management, Minerals, Recreation, Travel Management, and Hazmat. Regardless of the actual amount of acreage involved per subunit or alternative, the actions involved with these programs can and do directly disturb surface and subsurface sites in the following ways: firefighters building firebreaks with mechanized equipment or hand tools; drilling, testing, or open pits associated with mineral development, and the construction of roads to facilitate such actions; construction of trails, boat landings, and other recreational infrastructure; and cleaning up hazardous wastes at historic-era sites. In general, the potential for direct adverse impacts quantitatively increases from Alternative B to Alternative C to Alternative D. The impacts in Alternative A vary per subunit, alternative, and program, but would generally be less than Alternative D.

Cultural and paleontological sites could be indirectly affected by programs, including Lands and Realty, Forestry, Minerals, Fire Management, and Travel Management, that allow or facilitate access of people onto the public lands; and in particular, to areas that have been previously isolated. One prime example is the construction of new access routes to previously isolated lands. These provide new avenues of access for users of the public land, such as recreators and hunters. With more users accessing BLM-managed lands, there will likely be an increased number of people finding cultural and paleontological resources and adversely impacting them, either maliciously and intentionally, or else cumulatively and unintentionally. The potential for indirect adverse impacts for most subunits and alternatives increases from Alternative B to Alternative C to Alternative D. The impacts in Alternative A vary per subunit, alternative, and program, but would generally be less than Alternative D.

4.3.1.3.1. Effects Common to All Alternatives

All undertakings occurring on BLM lands would be evaluated to identify their effects on cultural and paleontological resources, as well as the mitigation of adverse effects on significant sites, as prompted by current federal regulations. Minimally, Level I inventories (literature searches) would occur for all undertakings to assess the potential effects. Level III inventory (intensive on the ground survey) would occur when the potential for cultural resources are considered to be high or surface disturbance is likely. If new cultural resources are found and they cannot be avoided by the undertaking, they would be evaluated for significance, or eligibility to the National Register of Historic Places. A similar process for identifying and mitigating significant paleontological resources would also occur through consultation with experts in the field.

Effects from Lands and Realty

The authorization of new roads, trails, or ROWs, which would causally lead to surface-disturbing activities by other resource users or programs, have the potential to directly and adversely impact cultural and paleontological resources. In addition, there could be an indirect effect on surficial cultural resources; with the creation of new access routes, more people would have access to BLM-managed lands which were previously inaccessible. There would be an increased potential of more people finding surface cultural resources and potentially adversely impacting them, either intentionally or unintentionally.

Land disposal would result in such lands no longer having federal laws to protect any cultural or paleontological resources on them. If the transfer occurs to the State of Alaska, some measure of protection is assumed because the state has its own heritage resource laws. A programmatic agreement currently exists between the BLM and the State of Alaska regarding cultural resources and BLM's responsibilities under Section 106 of the National Historic Preservation Act ("Programmatic Agreement Under the National Historic Preservation Act for Land Transfers to the State of Alaska"). No such written agreement exists when dealing with the transfer of lands to private entities such as Native corporations, Native villages, or individuals. Cultural resources become the property of the private entity, and can be used, or not, in whatever capacity at the discretion of the landowner. As a result, transfer of lands out of federal jurisdiction to private entities could result in direct and indirect impacts to cultural and paleontological resources.

In all subunits and under all action alternatives (B, C, and D), ANCSA 17(d)(1) withdrawals are recommended for revocation. Withdrawal revocation would have the effect of opening some lands to new locatable mineral entry and mineral leasing. Lifting current withdrawals would indirectly affect cultural and paleontological resources where new lands are opened to surface-disturbing activities (such as mining and road construction) which in turn would have the potential to directly and adversely affect surface and subsurface cultural and paleontological resources. The specific effects from withdrawal actions are discussed more fully under Locatable Minerals.

Effects from Wildland Fire Management

Wildland fire suppression and fuel reduction activities have the potential to directly and adversely affect cultural resources through consumption by fire of surface structures and artifacts made from combustible materials, to disturbance of sub-surface artifacts either directly from fire or else indirectly from resulting tree-throws, to direct disturbance or destruction of surface or subsurface cultural resources from wildland fire suppression activities (e.g., movement of mechanical equipment; creation of firelines down to mineral soil), or indirectly by creating easier access to previously isolated areas by the construction of firelines.

Effects from Hazmat and Abandoned Mine Lands

Hazardous materials are sometimes found at historical-era sites, and their cleanup could adversely affect cultural resources, especially if subsurface disturbance is required as in the case of soil contamination. Abandoned Mine Land sites, by definition, are cultural sites. Cleanup and/or addressing other safety concerns at such sites could adversely affect them, especially if subsurface disturbance is required.

Effects from Fluid Leasable Minerals

In terms of fluid leasable minerals (e.g., oil and gas), all lands are presently withdrawn and there are no existing leases. As a result, there are presently no effects to cultural and paleontological resources. Acreage is technically opened up to leasing in each of the action alternatives, increasing in amount from Alternative B, to Alternative C, to Alternative D. However, leasing would not occur under any alternative without further NEPA analysis. Interest from industry is expected to be limited on even higher potential areas. If a nomination for a lease does occur, a new NEPA analysis of its impacts on cultural and paleontological resources would be performed at that time. Since it is assumed that no leasing, exploratory drilling, or development will occur during the life of this plan, there would be no effects to cultural and paleontological resources at this time under any of the alternatives in any subunit. Seismic exploration could occur on high potential lands in the Steese and Upper Black River subunits. This seismic exploration would

have minimal to no impact to cultural or paleontological resources for any alternative because it would be conducted in the winter using low pressure vehicles.

Effects from Solid Leasable Minerals

In terms of solid leasable minerals (e.g., coal, potassium, sodium, phosphate), all lands are presently withdrawn and there are no existing leases. As a result, there are presently no effects to cultural and paleontological resources. Acreage is opened up to leasing in each of the action alternatives, increasing in amount from Alternative B, to Alternative C, to Alternative D. Interest from industry is expected to be limited because of low or no occurrence potential, and/or lack of economical access. Since it is assumed that no leasing would occur during the life of this plan, there would be no effects to cultural and paleontological resources under any of the alternatives in any subunit.

Effects from Salable Minerals

Mineral material sales (e.g., sand and gravel), as with all surface-disturbing activities, would have the potential to adversely impact all manner of cultural and paleontological resources. It is estimated that no more than 200 additional acres of authorized disturbance on BLM lands would be required to meet material demands over the next 20 years, regardless of the alternative selected. These sites would most likely be located near highways, roads, or existing BLM facilities. Even though acreage is closed to salable mineral extraction under each of the action alternatives, decreasing in amount from Alternative B, to Alternative C, to Alternative D, impacts would not vary by alternative. In sum, there is a potential to directly and adversely impact cultural and paleontological resources by this program, although the effects would likely be limited, due to the limited demand for mineral materials on BLM lands.

4.3.1.3.2. Alternative A (No Action)

Effects from Forest and Woodland Products

Under Alternative A, there are presently few restrictions on the use of timber and forest products in the planning area. Most lands are open to personal use of timber and forest products. Approximately 4,532,000 acres are open to commercial timber sales, however there has been no demand for these types of sales. No commercial timber harvest is permitted in the Steese NCA and White Mountains NRA thus there would be no effects in these specific areas. Subsurface cultural and paleontological resources would not be affected by the harvesting of timber and forest products, provided standard stipulations about extraction methods are adhered to. However, there could be an indirect effect on surficial cultural resources; as more resource use permittees access BLM lands, there would be an increased potential of more people finding surface cultural resources and adversely impacting them, either intentionally or unintentionally.

4.3.1.3.3. Alternative B

Effects from Forest and Woodland Products

Alternative B would have the same indirect effects as outlined in Alternative A. There would be no direct effects on about 4,900,000 acres in the Steese NCA, the White Mountains NRA, the Upper Black River Subunit, the Eagle Recreational withdrawal, the Fort Egbert Historic Site, and the Fortymile, Beaver Creek, and Birch Creek WSR Corridors as these areas would be closed to

timber harvest and commercial use of forest products. The effects of limiting commercial use of timber would be slight, however, as lack of access and high-value timber would limit demand for these types of authorizations under all alternatives and in all subunits. On the remaining lands which would be open to various types of harvest, direct effects would be limited by employing the ROPs (Appendix A, *Required Operating Procedures and Fluid Mineral Leasing Stipulations*). Even in areas open to these uses, commercial sales would be unlikely due to the lack of high-value timber, and limited access. The effects would probably be slight as few, if any, commercial sales, are anticipated under any alternative or in any subunit. In terms of overall acreage, the potential for indirect impacts in Alternative B is less than Alternatives A, C and D.

4.3.1.3.4. Alternative C

Effects from Forest and Woodland Products

Alternative C would have the same indirect effects as outlined in Alternative A. Approximately 1,000,000 acres, including the three WSR corridors, the Salmon Fork ACEC, and the RNAs, would be closed to commercial timber sales and thus there would be no effects in these areas. All other lands, about 5,700,000 acres, would be available for commercial harvest subject to the ROPs. However, even in areas open to these uses, commercial sales would be unlikely. The effects would probably be slight as few, if any, commercial sales, are anticipated under any alternative or in any subunit. In terms of overall acreage, the potential for indirect impacts in Alternative C is less than Alternatives A and D, but greater than Alternative B.

4.3.1.3.5. Alternative D

Effects from Forest and Woodland Products

Alternative D would have the same indirect effects as outlined in Alternative A. Approximately 430,000 acres, including the three WSR corridors and the RNAs, would be closed to commercial timber sales and thus there would be no effects to cultural resources in these areas. All other lands, about 6,300,000 acres, would be available for commercial harvest subject to the ROPs. However, even in areas open to these uses, commercial sales would be unlikely. The effects would probably be slight as few, if any, commercial sales, are anticipated under any alternative or in any subunit. In terms of overall acreage, the potential for indirect impacts in Alternative D is greater than Alternatives A, B, and C.

4.3.1.3.6. Cumulative Effects

Cumulative impacts to cultural and paleontological resources can occur through incremental degradation of the overall resource base throughout the planning area from any of the sources of direct or indirect effects described in any of the Cultural and Paleontological Resources sections presented in this plan. Excepting especially rare or unique cultural site types or paleontological localities, the destruction of any one, two, or three, etc., sites of any particular age or functional type would not likely impact the overall, areal resource base, as there would likely be more of any similar type of site elsewhere in the planning area. However, cultural and paleontological resources are a non-renewable resource and the loss of any one of them is one less from a finite total. There would eventually be a point at which the cumulative overall destruction of sites would limit management options within any defined area, such as the planning area. Any

resource, resource use, or program that has direct or indirect adverse effects to cultural resources contributes to this overall loss over time.

A second type of cumulative impact is that which can occur at any individual cultural site or paleontological locality. Many low-level, seemingly minor, impacts that may not be individually adverse to a site can slowly and cumulatively grow into a larger direct adverse effect over time. Examples of these types of activities include walking or camping within, through, or around sites and features. Each individual footprint upon old wooden structural architectural elements may not appear to have an impact upon the site, but quantify that same effect by dozens of separate visitors, and those same structural elements slowly get ground into dust. Likewise, the slow, accrued movement of stones that form parts of tent rings or hearths by repeated visitation will eventually obliterate such features, even if all the original stones are left on site. Similarly, visitors to sites often feel an urge to connect with the past by removing a piece of the site when they leave, like an artifact. Removal of a one, two, or three, etc., artifacts would not likely effect overall site interpretation. However, even if artifacts are not diagnostic or seemingly “important” to overall site interpretation, there would come a point, if enough artifacts are removed, when the cumulative removal of enough artifacts from a site would irreversibly affect any interpretations that can be made about that site. Any resource use or program that promotes increased use and visitation upon public lands may be inadvertently adversely impacting cultural and paleontological sites in this cumulative manner.

4.3.1.4. Fish and Aquatic Species

Methods of Analysis

Indicators: Indicators are used to identify the level of impact. For aquatic resources, fish, and Special Status Species, the indicators used include water quality, riparian vegetation, streambank stability, and stream miles open to locatable mineral entry.

Methods and Assumptions: Potential impacts on aquatic resources, fish, and special status fish from each alternative are based on interdisciplinary team knowledge of the resources and the planning area and information gathered from the public during the planning process. Impacts were identified using best professional judgement and were assessed according to the following assumptions:

- Healthy riparian areas are critical for properly functioning aquatic ecosystems. Improvements or protection of riparian habitats would indirectly improve or protect aquatic habitats and fisheries. Adverse impacts to riparian habitats would indirectly degrade aquatic habitats and fisheries;
- Emphasis and management opportunities for maintenance or improvement of fish habitat conditions would occur in designated Conservation and Restoration Watersheds;
- Not all of the anadromous streams or extent of anadromy has been documented within the planning area;
- The lifting of mineral withdrawals will result in an increased number of placer mining operations with the potential to adversely effect fish and aquatic resources;
- All BLM land use authorizations would incorporate appropriate project design, ROPs, and mitigation to not result in any adverse long-term (>20 years) trends for water quality and aquatic habitats at the watershed level (6th level HUC).
- Reconstructed stream channels will be designed by an individual(s) trained and qualified for the task and the channel will be built as designed.

- Reclamation techniques will use an “adaptive management” approach to address potential problems allowing for corrective actions should they become necessary. These techniques will ensure applicable performance standards and required conditions are met at the conclusion of operations.
- The timeframes associated with long- and short-term impacts assume that channel equilibrium is maintained.
- The reasonably foreseeable development scenario for small- and large-scale placer mines (BLM 2009c) was used to estimate the number of stream miles that would be open to locatable minerals under each alternative.

Summary of Effects

Fish and aquatic resources are at the top of a hierarchical framework (pyramid) of stream functions (Harman et al., 2011). Starting at the bottom and working up, these functions include hydrology, hydraulics, morphology, physiochemical, and finally biology (fish and aquatic life). Within this hierarchical framework, higher-level functions are supported by lower-level functions (Harman et al., 2011). For example, the biological component cannot function without the physiochemical function, and so on. Since of this hierarchical framework, land use activities that diminish one or more of the lower level stream functions in the pyramid will adversely effect fish and aquatic resources. As such, the recovery of lower level functions is necessary to restore biological functions.

More specifically, fish and aquatic resources would be primarily affected by surface-disturbing activities which alter stream channels and floodplain connectivity, remove or impair riparian vegetation and function, or result in soil erosion and sedimentation to fish and aquatic habitat. These activities often include placer mining and road and trail construction that occur within or adjacent to riparian areas or waterbodies. Activities causing extensive stream channel alteration and riparian degradation (e.g., instream mining) will result in unavoidable short (5–10 years) and long-term (10–20 years) adverse impacts to fish and aquatic resources. Activities that disrupt stream channel equilibrium will initiate a series of channel adjustments (e.g., slope and sinuosity) which in turn can adversely impact aquatic resources both up and downstream of the activity. These impacts can persist for decades and may substantially increase the number of stream miles impacted far beyond the impact site.

The potential for and level of impact on fish and aquatic resources is dictated by the success and adequacy of protective measures such as maintaining riparian vegetation in proper functioning condition and application of mineral withdrawals, as well as ROPs and reclamation procedures. The No Action Alternative (A) would provide the greatest protection to fish and aquatic resources within the planning area because all four subunits are currently closed to new locatable mineral entry.

Alternatives B, C, and D open increasingly more acres and stream miles for locatable mineral entry, respectively. Alternative D would have the greatest potential to impact fish and aquatic resources.

4.3.1.4.1. Effects Common to All Alternatives

Proposed management of the following resources/resource uses/programs would have no anticipated impacts to fish and aquatic habitats and will not be analyzed further: Air quality, Cave

and Karst Resources, Cultural and Paleontological Resources, Special Status Species, Visual Resources, Renewable Energy, Social and Economic Conditions, and Subsistence.

Effects from Non-Native Invasive Species

Invasive species can adversely effect fish and aquatic resources through habitat change, predation, parasitic behavior, the introduction of disease, competition for food and space, and hybridization sometimes leading to the extinction of native species (Simberloff 2000).

Efforts in Alaska are mostly focused on the prevention of introductions, since much of the state remains unaffected by aquatic invasive species. However, numerous pathways exist in Alaska that could facilitate the introduction of aquatic invasives. These pathways include, but are not limited to, fish farms, intentional movement of species across basins, ship traffic and ballast water discharge, and sport angler gear contamination (Fay 2002). The establishment of introduced invasive species, given Alaska's climate, depend on the species origins. Global climate change may increase the susceptibility (Union of Concerned Scientists 2005) and likelihood of establishment. Several of the high threat species identified by Fay (2002) pose a risk to the aquatic environments and species within the planning area. These high threat species include the New Zealand mudsnail (*Potamopyrgus antipodarum*), zebra mussels (*Dreissena polymorpha*), and Whirling disease (*Myxobolus cerebralis*). Additionally, several aquatic invasive plant species, such as Japanese knotweed (*Polygonum cuspidatum*) and Eurasian water-milfoil (*Myriophyllum spicatum*), also could become established in the planning area and impact aquatic and riparian habitats.

The threat of non-native invasive species within the planning area is very real. In 2010, a substantial infestation of an invasive aquatic plant, *Elodea nuttallii*, was discovered in Chena Slough (Fairbanks area). This was the first time an invasive aquatic plant had been documented in Interior Alaska. It's thought to have been introduced by someone dumping aquarium water into Chena Slough. In other countries species of *Elodea* have "filled up" waterways with dense growths of plant material. *Elodea* adversely effects fish and fish habitat by displacing native flora and fauna, reducing stream flow, increasing sedimentation, and reducing recreational fishing opportunities. If *Elodea* continues to spread in Interior Alaska, it could have significant negative impacts on fish and aquatic resources within the planning area. *Elodea* is readily introduced and spread by boats, personal watercraft, and float planes. Local experts are currently working on plans to eradicate and stop the spread of *Elodea* in the Fairbanks area.

The costs associated with controlling invasive species is significant. For example, annual costs associated with Zebra mussels in the U.S. are estimated to be one billion dollars (Pimentel et al., 2005).

Considering the economic and cultural values of fisheries resources in Alaska, the costs associated with controlling aquatic invasive species would be substantial. Martinez et al., (2007) noted that the removal of invasive species may be an extremely expensive and time consuming endeavor that is not always successful. This underscores the importance of prevention in Alaska. Felt-soled wading products are being phased out state-wide in to help prevent the spread of aquatic invasive species. Actions such as Fire ROP, NIS-1e, would reduce the spread of invasives resulting from wildland fire suppression. The initial introduction of aquatic invasive species into the planning area would have adverse impacts at the local level; however as time progressed long-term, major adverse impacts would be expected as invasives spread across the planning area.

Effects from Soil, Water, and Vegetation Management

Fisheries and aquatic habitat would benefit from the proper management of soils, water, and vegetation. The implementation of numerous ROPs and Stipulations designed to protect soil, water, and vegetation on a project-specific basis would reduce disturbance to fish habitats and would aid in the recovery of aquatic habitat from permitted uses. Land use activities that degrade soil, water, and vegetation resources would be expected to reduce the quality and quantity of aquatic habitats and fisheries.

Effects from Lands Managed for Wilderness Characteristics

Lands that are maintained or managed for wilderness characteristics would be potentially beneficial to the fish and aquatic resources found there. Management restrictions (e.g., conditions of use or mitigation measures) which avoid or minimize impacts to wilderness characteristics would also be expected to benefit fish and aquatic resources by minimizing surface-disturbing activities and decreasing the recovery time from disturbance.

Effects from Wildland Fire and Ecology Management

Wildland fire effects which directly impact fish populations include increased siltation, altered water quality (dissolved oxygen, pH, suspended and dissolved solids, total hardness, turbidity), and water temperature changes. Indirectly, any alteration of the nutrient flow that adversely affects aquatic organisms or results in a reduction in emergent insect production would also affect fish populations, at least temporarily. Thawing of permafrost can lead to altered hydrology, which in turn influences hydraulics, morphology, physiochemical, and biological stream function.

Stream siltation is usually negligible from surface erosion on burned sites in Interior Alaska due to its gentle topographical features. Siltation may be a factor where severe burns occur on steep slopes or even shallow slopes with ice-rich active layers, where wildland fire has severely damaged riparian protection of a banks soil integrity or where heavy equipment is used in suppression activities. Lakes are also potentially vulnerable to wildland fire effects of nutrient concentrations, sedimentation, and erosion of riparian protected shorelines from wave and wind action.

Data on how wildland fire affects stream temperatures and productivity are currently inadequate to accurately assess the effects of wildland fire on anadromous or resident fish habitats. Much of the published work has focused on changes in lake systems (McEachern et al., 2000, St-Onge and Magnan 2000). Analyses of long-term fire effects on stream ecology are currently under way as part of Frostfire, a landscape-scale prescribed research burn in the boreal forest of Interior Alaska conducted in July 1999.

Fish populations have generally shown a positive response during the initial five-year period after wildland fire, where populations can migrate to and from critical habitat throughout the watershed (Gresswell 1999; Minshall et al., 1989).

Fish will generally re-invade burned areas rapidly where movement is not limited by barriers. These new colonists generally come from areas upstream of the affected area, from surrounding watersheds and from main stem rivers where migration is not limited. Fish population recovery generally tracks the increase in primary and secondary production that occurs in the early postfire period. Where sediment is continually delivered into the stream, there could be short-term negative effects on the fish and macro-invertebrate communities.

Fuels projects are designed and implemented in a “non-emergency” manner that minimizes impacts to aquatic resources. Wildland fires may still occur in areas where hazardous fuel loads have been reduced, however these fires are typically less intense than crown fires. Crown fires can effectively “bake” the soil, reducing available nutrients to plants during the revegetation process and decreasing the soils ability to absorb water, which results in increased runoff and erosion. Ground fires are easier to control with lower-impact suppression methods (such as hand-built fire line) that are less likely to adversely affect aquatic resources. In contrast, the crown fires associated with heavier fuel loads often require suppression techniques likely to have greater adverse impacts to aquatic habitats and species.

Careful planning and implementation will minimize the adverse effects of fuels treatments. Some projects involve multiple treatments of the same area. Prescribed fires conducted in the spring (when drainage-bottoms are still snow covered) help to protect riparian vegetation and soils. The primary goal of these projects is to reduce the occurrence, risk, and impacts of wildland fires, not to restore the natural capacity of aquatic species to withstand the effects of natural fires. Removal of vegetation to reduce future fuel loading may be accomplished with minimal impacts in some areas, but in others, sensitivity to ground disturbance from loss of vegetation can cause increased erosion, compacted soils, and a loss of nutrients (USDA and DOI 2000, Beschta et al., 1995).

Impacts to fisheries from wildland fire and fuels management would be the same under all Alternatives. Most of the planning area is in a Limited fire management option designation, which means that the standard response is to monitor wildland fires and only initiate suppression actions if necessary to protect identified values. If wildland fire suppression actions occur, effects to fish and fish habitat would be from increased erosion and ground-based control (fire breaks), and alterations of water chemistry from aerial applications of fire retardant. Erosion impacts would likely be small in scale and localized, and could be minimized by rapid rehabilitation after the fire is under control, although improperly located bulldozer line firebreaks could greatly increase local stream sediment loads. The use of fire retardant in or near fish bearing streams is a serious threat to these aquatic ecosystems. The by-products of certain retardants are toxic to fish and will result in fish kills. To decrease the potential of affecting fish habitats and stream conditions, it is a standard operating procedure of the suppression agencies to avoid dropping retardant near or in waterbodies (ROP FM-1d).

Effects from Forest and Woodland Products Management

Forest harvest activity within the planning area generally consists of small-scale timber removal for personal use. The removal of trees within the riparian zone would reduce the natural source of large woody debris, reducing habitat complexity for fish. Removing trees within the riparian zone could also result in increased water temperatures and streambank erosion, both of which adversely affect fish and the aquatic habitat. Maintaining appropriately sized buffers (no tree cutting) along streams and riparian areas would greatly reduce impacts to fisheries and aquatic habitats.

The construction of temporary roads providing access to timber sales could increase the sediment supply to nearby streams and lakes. Migration barriers to fish may be created if road culverts are not properly designed, installed, and maintained. However, ROP FA-1 would minimize this effect. If access restrictions and forest ROP 1B (stream buffers) are applied, there would be no significant impacts to fisheries and aquatic habitat.

Effects from Minerals Management

Mining of placer gold deposits is projected to be the primary type of mineral development over the life of the plan. The following sections describe the specific effects of placer mining on fish and factors that influence the condition and quality of aquatic habitats, including channel stability and riparian vegetation.

Suction Dredging

Suction dredging, a type of placer mining, can have both beneficial and adverse effects on fish and aquatic habitat depending on the timing and location of the activity. It's assumed that suction dredging operations would occur under Notice level operations which requires a description of how reclamation will be performed to meet specific performance standards found in BLM's Surface Mining regulations, specifically, the rehabilitation of fish habitat (43 CFR 3809.420 (b)(3)(ii)(E)).

Suction dredging has been shown to locally reduce benthic (bottom dwelling) invertebrates (Thomas 1985; Harvey 1986), cause mortality to early life stages of fish due to entrainment by the dredging equipment (Griffith and Andrews 1981), destabilize spawning and incubation habitat, remove large roughness elements such as boulders and woody debris that are important for forming pool habitat and that can govern the location and deposition of spawning gravels (Harvey and Lisle 1998), increase suspended sediment, decrease the feeding efficiency of sight-feeding fish (Barrett et al., 1992), and reduce living space by depositing fine sediment (Harvey 1986).

Conversely, suction dredging may temporarily improve fish habitat by creating deep pools or by creating more living space by stacking large non-embedded substrate (Harvey and Lisle 1998). In dredged areas, invertebrates and periphyton are known to recolonize relatively rapidly, as long as the disturbance area is sufficiently limited to maintain populations of recolonizing organisms (Griffith and Andrews 1981; Thomas 1985; Harvey 1986). In addition, dredge tailings may increase spawning sites in streams lacking spawning gravel or streams that are armored by substrate too large to be moved by fish (Kondolf et al., 1991). In some cases, the reduction in the feeding efficiency of fish may be offset by reduced visibility and the corresponding reduced risk of predation at moderate levels of suspended sediment (Gregory 1993).

Conventional Mechanized Mining

Conventional mechanized placer mining involves the use of heavy equipment to access gold deposits. One method of mine development is to move the stream into a bypass channel, while the original stream channel is excavated for gold deposits. During this process the streambed, streambanks, and riparian vegetation are removed in order to access gold-bearing fluvial deposits which may extend to the bedrock. This method destroys the existing fish and aquatic habitat and eliminates all biological stream functions. During the reclamation phase of the operation, the stream is either left in its bypass channel or returned to a newly built channel while the overburden and tailings are contoured to the surrounding topography. Reclamation of the mined area requires the rehabilitation of fisheries habitat as found in BLM's Surface Mining regulations (43 CFR 3809.420 (b)(3)(ii)(E)). Other common methods of mine development occur adjacent to, but outside of the stream channel. Impacts to fish and aquatic habitat can be severe and last for decades under the stream-altering bypass method, where mining outside of the stream channel with the use of an adequately sized stream buffer generally results in minimal impacts.

Stream bypasses and newly established stream channels are often built using generalized criteria with the intent of mimicking the natural pattern and profile of the pre-disturbed stream channel. Following reclamation, stream channels are left to adjust at the pace of natural fluvial processes

Figure 4.1, “Stream Following Post-Mining Reclamation and Undergoing Natural Adjustments to its Form (Uhler Creek, 2009)”. During this adjustment period, the stream takes on a form dictated by the amount of runoff and sediment derived from the upstream catchment area. Over a period of time, inflow of sediment to the stream will equal the outflow and a state of equilibrium will be achieved. Once this balance is achieved, the stream is considered to be in a stable form (Leopold et al., 1992); however, this process can take decades or more to achieve after reclamation activities are concluded (Tidwell et al., 2000). An important factor in a stream’s ability to achieve a stable state is the recovery of adjacent riparian vegetation (Yang 1996, Karle and Densmore 2001). A healthy and functioning riparian community (Figure 4.2, “Stream Demonstrating a Stable Channel and Riparian Community in Proper Functioning Condition (Uhler Creek, 2009)”) stabilizes streambanks and unconsolidated material within the floodplain, reducing the amount of sediment that enters the stream and that must be transported in order to achieve a stable state. In watersheds lacking channel stability and riparian function, sedimentation becomes a factor in the suitability of the habitat for fish.



Fortymile Subunit, 2009

Figure 4.1. Stream Following Post-Mining Reclamation and Undergoing Natural Adjustments to its Form (Uhler Creek, 2009)



Fortymile Subunit, 2009

Figure 4.2. Stream Demonstrating a Stable Channel and Riparian Community in Proper Functioning Condition (Uhler Creek, 2009)

Influence of Excess Sediment

In their natural environment, the survival of fish and other aquatic species depends upon many factors, including; availability of food, predator avoidance, immune system health, and reproduction. Although sediment is a natural part of the aquatic ecosystem, an increase in fine sediment as a result of ground disturbing activities and stream channel instability has the potential to adversely affect all of these factors. It can also create stressful conditions that could increase aquatic species' susceptibility to disease.

Sediment in streams deposited in spawning gravels can smother fish eggs and reduce the amount of intergravel space available for eggs, juvenile fish, and other organisms. This is especially critical in the winter months, when intergravel space is used as refugia and allows fish and other aquatic species to survive under severe flow and temperature conditions. At other times of the year these interstitial spaces act as a conduit providing developing fish eggs and larvae with cold, oxygen-rich water and larger juvenile fish with cover from predators and high velocity stream flows.

The filling of pools with sediment further limits overwintering and summer feeding sites for juvenile and adult fish (Meehan 1991). Aquatic habitat surveys conducted by the BLM on post-reclamation streams have found that streams often lack the diversity of habitats (pools, riffles, glides) and cover components (undercut bank, overhanging riparian vegetation, large woody debris) that are necessary for aquatic biodiversity and population recovery. Not surprisingly, the lack of habitat diversity has resulted in a reduction of fish densities within post-reclamation stream segments by twenty-six to eighty percent (Kretsinger and Lundeen 1995, Kretsinger 2006).

Direct effects of increased sediment loads on aquatic invertebrates include the loss of habitat due to scouring of streambeds, displacement of individuals, smothering of benthic communities, loss of interstitial spaces between substrate particles, abrasion of respiratory surfaces, and interference

of food uptake for filter feeders (Beschta et al., 1995, Milner and Piorkowski 2004). Many of the macroinvertebrates that are favored as food by fish (e.g., mayflies, caddisflies and stoneflies) prefer coarse streambed substrates and are impacted by an increase of fine sediments.

Sediment pollution in the form of turbidity is one of the more common forms of pollution in Alaskan waters (Lloyd et al., 1987). It is known to affect freshwater fish in a variety of ways, including: decreased food availability (reduced primary and secondary production), reduced growth and survival, altered migration timing of salmon smolt, reduced feeding efficiency in sight-feeding species, stress, and avoidance (effects summarized in Lloyd et al., 1987). Many streams within the Interior of Alaska where conventional mining methods have been used experience short duration but chronically occurring episodes of elevated turbidity as a result of destabilized stream channels and sheet erosion. Turbidity commonly exceeds the state standard during periods of high flow and as a result of water control issues during active mining operations. Recent inspections of some mine sites noted turbidities levels that were 60 to 300 times greater than that of the state standard due to water control issues (BLM 2009b and 2009c). Elevated turbidity, as a result of placer mining, in the upper Birch Creek watershed led to its listing as an impaired water in 1992 (ADEC 2008). BLM continues to monitor turbidity in upper Birch Creek, and although water quality has generally improved, recent monitoring (2011) revealed turbidity levels exceeding ADEC standards due to upstream placer mining operations.

Riparian Vegetation

Riparian vegetation is directly related to the health and productivity of the aquatic environment. The removal of riparian vegetation results in the loss of a variety of functions normally provided by a healthy functioning riparian community. Many of these functions are related to the stability of the stream channel, but some of the functions are directly related to the maintenance of high quality habitat, as described in Chapter 2. Post-reclamation stream characteristics, which lack the stabilizing influence and other functions normally provided by a healthy and functional riparian community, are typically not suitable to species or life stages of fish and other aquatic organisms that occurred prior to disturbance. Some of the conditions normally encountered following reclamation are disconnected floodplains (further limiting the moisture available to plants); tall, vertical, and unstable streambanks as a result of stream channel incision (streambanks continue to erode and prevent vegetation from establishing); aggravated icing conditions (aufeis) due to the removal of riparian vegetation (which exposes the stream to wind scour and loss of the insulating properties of snow); and the altered stream channel geometry and surface - groundwater interaction. The loss or reduced quality of the habitat is expressed through changes in cover, energy (food) availability, and living space.

Passive reclamation techniques, which are the most commonly employed, rely on time and natural processes for recovery. This technique results in the prolonged recovery (decades) of riparian vegetation and riparian proper functioning condition. Since riparian vegetation is a mid-level function and biological communities (fish) are a top-level function within the stream function pyramid, fish communities experience similar recovery times (decades) under passive reclamation. Accelerated runoff from denuded areas and streams left in altered configurations can trigger headcutting of the streambed, which lowers the streambed and water table, disconnects and dries out the riparian vegetation, destabilizes streambanks, increases erosion, and further accelerates runoff and changes to channel pattern and profile. Unless stopped by some form of intervention or a hard geologic formation, headcutting may migrate upstream and further disrupt the hydrologic function of the stream system (Rosgen 1996).

Accelerated runoff may also result in water velocities that cause involuntary downstream displacement and mortality of juveniles, result in scour-related mortality of eggs and alevins, accelerate streambank erosion, and over the long-term, deplete large woody debris and organic material. The enlargement of stream channels may result in a shallow, braided channel, slow water environment during periods of low flow. This new environment can result in reduced pool size and crowding of fish, loss of spawning habitat, reduced primary and secondary productivity, increased vulnerability to predation, elevated water temperatures, and increased sedimentation (Swanston 1991; Hicks et al., 1991; National Research Council 1992; Strouder et al., 1997).

Rates of revegetation on sites disturbed by placer mining are quite variable and are influenced not only by the natural conditions that define the subarctic environment but the post-reclamation conditions as well. The subarctic environment is characterized by having a short growing season, low temperature, nutrient poor soils, and relatively low precipitation (Chapin et al., 2006), which all act to limit plant growth. These limiting conditions, coupled with post-reclamation conditions, can prolong riparian recovery. Additionally, aufeis, essentially the formation of a glacier within the active floodplain, can develop and persist into July in areas where stream channels have been altered (Figure 4.3, “Aufeis on a Post-Reclamation Stream Channel During Mid-June”). During the period of ice cover soil temperatures are maintained near freezing, effectively reducing the growing season by several weeks or longer.

Under more suitable conditions vegetation can recolonize vigorously within 10 to 15 years following reclamation, but may remain in non-functioning condition for decades if disconnected from the floodplain and subject to vertical, unstable banks (Figure 4.4, “This Post-Reclamation Riparian Community Demonstrates Vigorous Growth 10 to 15 Years Following Reclamation, But Remains in Non-Functioning Condition Due to the Disconnected Floodplain and Vertical, Unstable Banks (Steese Subunit, 2009).”; BLM unpublished mine site observations). Under less optimal conditions little or no vegetative cover has been established 50 or more years after the last episode of mining (Arnett 2005; Milner and Piorkowski 2004, Weber and Post 1985). In the absence of human intervention, the time required for riparian areas to attain proper functioning condition after major disturbances is dictated by natural processes and is commonly measured in decades rather than years (Tidwell et al., 2000, Arnett 2005, Viereck et al., 1993; Milner and Piorkowski 2004, BLM 1988a,b,c).

Most of the impacts associated with conventional methods of mining would be alleviated with the use of riparian buffers. Riparian buffers mitigate the potential loss or reduction of riparian resources and the associated fish and aquatic habitat by providing an area of undisturbed land between the natural channel and the mining operation. Fish and aquatic species benefit when stream buffers are used because desired aquatic habitat conditions (Chapter 2) are maintained. The use of buffers has been widely recognized as an effective way to maintain the riparian community in proper functioning condition, provide for a stable stream channel and retain the productive capacity of the natural stream environment (Figure 4.5, “Proper Functioning Riparian Community Providing a Diverse Composition of Aquatic Habitat Features” (USDA and DOI 2000, Fischer et al., 2000). In 1989, the BLM recommended the use of buffers as a practical means for minimizing disturbance in their handbook “Placer Mining in Alaska, A Guide to Mitigation and Reclamation.” In 2000, stream buffers were incorporated into an approved plan of operation (BLM 2000) and most recently, the BLM adopted the use of stream buffers in the Kobuk-Seward Peninsula Management Plan (BLM 2008d).

In summary, placer mining can negatively effect fish and aquatic resources by degrading or eliminating aquatic habitat; reducing available food sources and water quality; reducing available

pool habitat; eliminating riparian vegetation and function; creating sparsely vegetated valleys and floodplains with slow rates of natural revegetation and unstable stream channels with highly erodable beds and banks; altering the longitudinal slope, geometry, and sediment transport rates in streams; and creating undersized or absent floodplains.



Steese subunit, 2009

Figure 4.3. Aufeis on a Post-Reclamation Stream Channel During Mid-June



This post-reclamation riparian community demonstrates vigorous growth 10 to 15 years following reclamation, but remains in non-functioning condition due to the disconnected floodplain and vertical, unstable banks (Steese subunit, 2009).

Figure 4.4. This Post-Reclamation Riparian Community Demonstrates Vigorous Growth 10 to 15 Years Following Reclamation, But Remains in Non-Functioning Condition Due to the Disconnected Floodplain and Vertical, Unstable Banks (Steese Subunit, 2009).

The Effect of Proposed Management Actions in RCAs and ACECs

Over the range of action alternatives, from zero to fourteen percent of the stream miles opened to locatable minerals would fall within watersheds containing ACECs (that meet the relevance and important criteria for fish and aquatic resources) or RCAs. The requirements listed in management of watersheds (Chapter 2, Fish and Aquatic Species) apply in RCAs and ACECs. In addition to these requirements and to meet the management goals in RCAs (Chapter 2, Fish and Aquatic Species Watersheds), the collection of stream-specific baseline hydrological data, active revegetation, and streambank stabilization techniques would be required for actions proposing to alter stream channels (e.g., placer mining). These additional requirements within RCAs and ACECs would improve the chance of obtaining desired future conditions for aquatic habitats within the specified timeframe (less than three years).

A range of success would be expected based on several factors. These factors include the technique used for baseline data collection and the method of stream channel design, the reclamation measures specified for a particular operation, the characteristics of a particular watershed, the quality and quantity of growth medium available for vegetation, and the probability of experiencing a flood that exceeds the capability of the stream channel prior to the establishment of riparian vegetation capable of resisting flood flows.

Assuming that baseline data is collected and reclamation is designed using the best available techniques such as those outlined in the Natural Resources Conservation Service's (NRCS, 2007a)

Stream Restoration Design, National Engineering Handbook, Part 654 and all of the factors previously mentioned are favorable, it's likely that instream habitats would rehabilitate within a short (less than three years) timeframe. If so, impacts would be considered minor and short-term. However, stream channel design/reconstruction and aquatic habitat rehabilitation is very complex and even more so within the planning area due to the harsh environmental conditions (short growing season, aufeis, etc). Recognizing this complexity, a more realistic outcome may be a strong positive trend toward the desired habitat conditions within five to ten years under this management scenario. It would be essential that reclamation plans incorporate stream channel design based on channel forming discharge (typically 1.5 yr recurrence interval) and the floodplain be capable of transporting 100-year flood flows. This would minimize the chance of reclamation failure and partially fulfill the requirements of executive orders 11988 (floodplain management) and 11990 (wetland protection) to restore floodplain and wetland function.



Upper Black River Subunit, 2009.

Figure 4.5. Proper Functioning Riparian Community Providing a Diverse Composition of Aquatic Habitat Features

Effect of Proposed Management Actions Outside of RCAs

Over the range of action alternatives, from eighty-six to one-hundred percent of the stream miles open to locatable minerals would not be within RCAs or ACECs (that meet the relevance and important criteria for fish and aquatic resources). The requirements for stream channel design and reconstruction are less stringent in areas outside of RCAs and ACECs (Chapter 2 - Fish and Aquatic Species Watersheds). For example, if stream specific baseline data is not available or easily obtained, more generalized data may be used for designing the reconstructed channel. Also, either the use of active revegetation or anchored rocks/logs to stabilize streambanks, prevent erosion, etc., may be required, but not necessarily both.

A range of success would be expected based on several factors. These factors include the thoroughness of the techniques used for baseline data collection and stream channel design, reclamation measures specified for a particular operation, the characteristics of a particular

watershed, the success of restoring stream and riparian functions, and the probability of experiencing a flood that exceeds the design capability.

On one end of the spectrum, if the basic steps in alluvial channel design are strictly adhered to (Chapter 2, Fish and Aquatic Species Watersheds and NRCS, 2007a), the morphological characteristics used to design the channel closely resembled those of the pre-disturbed channel, and all of the previously mentioned factors are favorable, desired habitat conditions may be achieved within 5 to 10 years. If so, impacts to fish and aquatic resources would be low to moderate and considered short-term. Again, realizing the complexity of stream channel design/reconstruction and aquatic habitat rehabilitation, a more realistic outcome from this level of reclamation would be a strong positive trend toward the desired habitat conditions within 10 to 20 years. This outcome assumes that reclamation plans provide for the proper design and construction of the stream channel and floodplain to ensure floodplain connectivity is maintained.

If reclamation measures similar to those used in the past are employed (see measures previously described under Conventional Mechanized Mining) in conjunction with the application of common bio-engineering techniques (e.g., willow plugs) it is anticipated that unstable channel conditions would persist beyond 20 years dependant on the energy gradient of the system. The outcome of reclamation efforts would likely reflect that of natural succession (Vioreck et al., 1993, Chapin et al., 2006) with an overall progression toward later successional stages interspersed by setbacks to earlier stages. The gradual progression over time would lead to the development of desired fish and aquatic habitat conditions but this is not likely to occur within the life of this plan.

Currently there are 33 mines working under an approved Plan of Operations within the planning area. These operations would not fall under the management requirements discussed above unless their current authorization expired or until a substantive modification of an existing Plan of Operations was proposed. Impacts to fish and aquatic habitat by placer mines operating under an existing authorization are projected to be similar to impacts commonly observed from past placer operations as discussed previously.

Effects to Aquatic Special Status Species

Four BLM Sensitive aquatic species are known to occur within or adjacent to the planning area. Effects to these species from mineral development/management would be similar those described above for fish and aquatic resources. Specific effects cannot be estimated due to limited information on the distribution of these species.

The Alaskan Brook Lamprey *Lampetra alaskensis* has been found in the Chatanika and Chena rivers, within the Steese Subunit, but are not yet known to occur on BLM-managed lands. Spawning activity and early life stages (the first four years of life) of the Alaskan Brook Lamprey may be especially vulnerable to disturbance from suction dredging and placer mining.

The Alaska Sallfly *Alaskaperla ovibovis* is a rare species of stonefly known to occur in the West Fork Dennison Fork of Fortymile River, within the Fortymile Subunit.

The Alaskan endemic mayfly *Rithrogena ingali* is known from only a single specimen collected on Birch Creek, within the Steese Subunit. Since it is only identified using characteristics of adults (which are not often collected) it likely occurs more widely.

The mayfly *Acentrella feropagu* has been found very near the northern boundary of the planning area, but has not been documented within the planning area.

Effects from Salable Minerals

Demand for gravel, rip-rap and other salable minerals is expected to increase slightly during the life of the plan. Currently, there are approximately 160 acres of material sites within the planning area. It is assumed that no more than 200 acres of authorized disturbance on BLM-managed lands would be required to meet material demands over the next 20 years, with the acreage split fairly equally between the Fortymile and White Mountains Subunits (Chapter 4, Assumptions for Analysis). There are no known adverse effects from salable minerals on fisheries and aquatic habitat within the planning area at the current time and none are anticipated.

Effects from Recreation and Travel Management

Recreation use within the planning area is expected to increase over the life of the plan, and the impacts to fisheries and aquatic habitat from recreation may also increase. Impacts to fish and aquatic habitat generally increase with increasing levels of OHV use especially in areas open to off-trail use. Without adequate enforcement, off-trail use may continue and will likely increase given the general increase in OHV use, even in areas that are restricted to designated trails. Unmanaged trail proliferation, with no guidance for proper construction and placement of new trails, can result in increased erosion and sediment impacts.

Potential impacts to fisheries and aquatic habitats from OHV use would result from disturbance to riparian habitats and streambanks. The loss of riparian vegetation and subsequent bank erosion lead to increased stream sedimentation resulting in diminished water quality. Increased sedimentation in streams could affect fisheries in a variety of ways, including direct mortality, reduction in suitable spawning gravels, reduction in summer and winter rearing habitat, suffocation and mortality of eggs, and displacement of individual fish.

Where trails cross streams, soil and vegetation may be altered or destroyed resulting in unstable and eroding streambanks. The impacts to fisheries and aquatic habitat can be minimized if vehicle stream crossings are made at stable sections of the stream (rocky or gravel soils) and crossed as close as possible to a 90 degree angle in shallow riffle areas (ROP Water 5c). Crossing of anadromous streams or rivers with a vehicle requires a fish habitat (Title 16) permit from the ADF&G online at <http://www.habitat.adfg.alaska.gov/fhpermits.php>. Temporary campsites or development of trails can also lead to the trampling of streambanks and the associated loss of vegetation and streambank erosion. In addition, trails should not be routed or constructed so as to collect and carry overland runoff and sediment to streams.

Aside from placer mining, road maintenance and development poses the second greatest threat to fish and aquatic habitat. Disturbance of soil and rock during road construction creates a significant potential for erosion and sedimentation of nearby streams. Roads greatly increase the frequency of landslides, debris flow, and other mass movement. Culverts, if not designed and maintained properly, often create migration barriers to fish resulting in a loss of habitat. Road construction is a major ground disturbing activity with potential long-term impacts to fish and aquatic resources.

With an increase in recreational use, typical pollutants such as soaps, human waste, and fuels also increase. These pollutants can be introduced into the aquatic environment from accidental spills or when used in close proximity to streams and lakes.

4.3.1.4.2. Cumulative Effects

Cumulative Effects from Climate Change

The Eastern Interior of Alaska is projected to become warmer and drier over the next century. Field data collected in several streams by the BLM within the planning area suggests that water temperatures exceed the State of Alaska water quality threshold for freshwater fish (18 AAC 70.015) (BLM unpublished data, 2009) due to residual impacts from placer mining. Within stream systems exhibiting altered geomorphology and reduced riparian cover, water temperatures may limit fish distribution. Increased water temperature from climate change could further limit fish distribution seasonally, especially within altered stream systems.

Cumulative effects from Locatable Mineral Entry

The BLM is responsible for managing twenty-two percent of the land (6.7 million acres) within the planning area. Within BLM-managed portions are approximately 11,000 miles of streams, 400 miles of which are anadromous representing twenty-one percent and fourteen percent of the total stream and anadromous miles within the planning area, respectively. Consequently, the impacts from activities managed under the proposed alternatives could play a distinctive role in the cumulative effects occurring within the analysis area. Given the protective measures incorporated into the action alternatives, activities that occur on non-BLM lands, such as placer mining on state-managed lands, have more potential to impact fish and aquatic resources at the planning area scale than lands administered by the BLM.

Stream altering activities in some watersheds within the planning area, such as the Birch Creek watershed, have reduced the available fish habitat and have caused a downward trend in local fish populations (BLM 1988a). This is due at least partly to the adverse cumulative effects that have occurred from past activities. Ongoing activities or adverse conditions that remain in such watersheds may remain for the life of this plan (20 years) due to the decadal time scale of recovery (Tidwell et al., 2000). The intent of the reclamation standards and procedures laid out in the fisheries section is to reduce and or shorten the adverse impacts to fish and aquatic habitat from the effects of placer mining and to reverse this downward trend.

Locatable mineral development has occurred within the planning area and will continue into the future. Stream altering activities will continue to be a potential threat to fish and aquatic resources within the planning area. Fish and aquatic habitat open to locatable minerals are at risk of being lost or degraded during both the short- and long-term. The proposed requirements for stream channel reconstruction combined with other improved reclamation techniques are an attempt to minimize impacts and result in a strong positive trend toward desired habitat conditions within 3 to 10 years in RCAs and ACECs and within five to twenty years in all other watersheds, while still allowing for mining. When riparian zones remain in properly functioning condition the fish and aquatic habitat will likely remain in natural and desired conditions. If placer mining continues to occur and in conjunction with current reclamation practices, then fish and aquatic resources will likely continue a downward trend (Arnette 2005, Tidwell et al., 2000, BLM 1988b).

Two large-scale lode mines may be developed within the planning area on state or private land within the life of this plan. One lode mine is known as “Money Knob” and is located near the town of Livengood which is on the western edge of the White Mountains Subunit. It is assumed that ore at “Money Knob” will be extracted using a heap leach facility with the use of sodium-cyanide. This method of mining can have long-term environmental consequences. Water

from precipitation or surface flow can become contaminated when it comes in contact with mining wastes, including waste rock and tailings. Effluent water that contains mineral processing chemicals such as cyanide may also leak from leach pads, well seals and pipes. The result of contaminated effluent water leaking into nearby waterbodies at mine sites in Colorado, South Dakota, Idaho, and New Mexico varies from reductions in viable fish populations to streams that no longer support aquatic life (Roth 2006). The other lode mine is located 35 miles northwest of the town of Chicken in the Fortymile Subunit. It is anticipated that this mine will use flotation techniques in indoor storage bins for ore processing.

Currently, there are approximately 900 valid federal mining claims containing approximately 191 miles of stream which have been mined or have the potential to be mined within the planning area. In addition to the federal mining claims, there are approximately 14,000 state mining claims within the planning area. The number of acres and stream miles affected by state mining claims is not currently available. Impacts on state claims would be additive to the effects from federal claims.

The action alternatives in this RMP propose to open 1,606 to 8,289 additional miles of stream to locatable mineral entry. This represents an eighty-eight to ninety-eight percent increase above the number of stream miles within current valid federal claims managed by the BLM (Table 4.5, "Stream Miles and Acres Open to Locatable Mineral Entry, All Subunits"). This is not to say mining is likely to occur on all of those stream miles, but those stream miles would be open to locatable mineral entry (see Locatable Minerals assumptions). Given the substantial increase in acres and stream miles open to locatable mineral entry in this RMP, combined with the recent and significant increase in gold prices, the potential cumulative adverse impacts from placer mining on state and federal claims during the life of this plan could be significant and result in: 1) short- and long-term effects, 2) local and regional reductions in fish and aquatic species, 3) potential reduction in species diversity, and 4) a continued downward trend of both quality and quantity of fish and aquatic resources within the planning area. Improved reclamation techniques, the application of ROPs and BMPs, and the maintenance of riparian vegetation and function would reduce impacts to fish and aquatic resources, but is not likely to reverse the downward trend.

There exists a wide range of potential disturbance to fish and aquatic resources from locatable mineral entry, as shown in the table below. RCAs in Alternative C (the preferred) consist of less than ten percent of the stream miles open to locatables. Of the 582 stream miles within RCAs open to locatables in Alternative C, 559 (ninety-six percent) occur in the Upper Black River subunit. Approximately 6,500 miles of stream would be open to locatables in areas with reduced levels of reclamation, as compared to reclamation requirements in RCAs. It may take twice as long (five to twenty years) to achieve desired habitat conditions in non-RCA streams. If Alternative C was the chosen alternative for all subunits in this RMP, there would be approximately 1,500 miles of stream open to locatable mineral entry within moderate to high mineral potential areas. Potential adverse impacts to fish and aquatic resources would be the least in Alternative A, progressively increase from Alternative B to C, and be the greatest in Alternative D.

Table 4.5. Stream Miles and Acres Open to Locatable Mineral Entry, All Subunits

ALL FOUR SUBUNITS (BLM-managed Lands)	ALTERNATIVES			
	A	B	C	D
Stream miles	11,000	11,000	11,000	11,000
Stream miles open to locatables (proposed)	0	1,606	6,883	8,289
Stream miles open to locatables (proposed) plus miles within current valid federal claims	191	1,797	7,074	8,480

Stream miles within RCAs in areas open to locatables (proposed)	0	41	582	419
Stream miles outside RCAs in areas open to locatables (proposed)	191	1,756	6,492	8,061
Acres open to locatables (proposed)	0	1 million	4.1 million	5 million
Acres open to locatables (proposed) plus acres within current valid federal claims	20,700	1 million	4.1 million	5 million
Anticipated stream gravel disturbance by suction dredging during life of plan measured in cubic yards	280,000	440,000	920,000	1.2 million
Potential impacts to fish and aquatic habitat (1–4, 4 = greatest)	1	2	3	4

Cumulative effects from Travel Management

Demand for both legal and physical access from all users will increase during the life of the plan. Demand for roads and transportation rights-of-way on BLM-managed lands will increase slightly during the life of the plan. Road development is contingent upon the economic viability of resource development, primarily minerals, and the needs of the State to plan and carry out transportation access in Interior Alaska. The proposed action alternatives in this RMP will lift the current locatable mineral withdrawals on one to five million acres, which could increase the need for road development for access to new mining claims. OHV use within the planning area is also increasing and the impacts to fisheries and aquatic habitat from OHV trails or cross-country use may also increase. Cumulative impacts from travel management within the planning area have the potential for long-term effects on fish and aquatic resources. The intensity of those impacts vary depending on the location of roads and trails in relation to streams and waterbodies as well as slope, aspect, soil type, and the method in which they are constructed. With the proper use of mitigating measures, ROPs, and best management practices, impacts could be greatly reduced.

Cumulative effects from Activities Outside of the Planning area

Fish populations are not restricted by land ownership or planning area boundaries. Many resident species migrate upstream and downstream annually and throughout their life cycles using aquatic habitat independent of land ownership. Anadromous fish migrate to the ocean as smolts (juveniles) and return years later as adults. Anadromous fish within the planning area migrate well over one thousand miles by the time they return as spawning adults crossing numerous managerial boundaries and varying environmental conditions. Fluctuating ocean conditions, harvest pressure, predation, and disease occurring outside of the planning area are significant factors effecting anadromous fish populations.

Other effects of activities in the planning area could include loss of fish habitat or reduction in habitat quality associated with oil and gas related development, invasive species, recreation, forest management, and realty actions.

4.3.1.5. Non-Native Invasive Species

Summary of Effects

Non-native invasive species (NIS), which includes plants, animals and pathogens, have resulted in costly environmental and economic impacts throughout North America. Impacts to vegetative communities and fish and wildlife species outside of Alaska include alteration of habitat, changes to fire regimes, competition for resources, and riparian function. Climate and a minimum of roads

and other disturbances, such as agriculture, have delayed the introduction and spread of nonnative invasive plants (NIP) in Alaska in the past (Carlson and Shepard 2007). Over the past decade of inventory and monitoring the number and distribution of NIP has increased, in some areas of the state by a factor of two or more (AKEPIC 2009 <http://akweeds.uaa.alaska.edu/>). Only some of the increase in species detected is due to increased emphasis on inventory of NIP. The emphasis of this analysis is on NIP rather than all invasive species.

Any disturbances on the landscape, whether natural, such as wildland fire and flooding events, or human caused, such as rights-of-way or trails, provide an opportunity for NIP to become established (Carlson et al., 2008). Pathways for spread often accompany the disturbance. Equipment, watercraft, vehicles and gear used for suppression of wildland fires or land uses, such as mining and recreation, may harbor seeds of NIP, which become dislodged at the site.

Invasive animals and pathogens are emerging as a new concern on public lands. Pathways for introduction are often the same for invasive plants, animals and pathogens. Most impacts analyzed in this chapter will be from resources and resource use on NIP. Prevention practices, early detection and rapid response, and outreach and education are the best defense against NIP.

Over the life of the plan, NIS are expected to expand at an increasing rate in Alaska, altering plant communities, impacting fish and wildlife habitat, introducing competition for resources and even increasing predation. Climate change predictions, including longer frost-free seasons and thawing of permafrost, indicate that conditions may accelerate the ability of NIS to become established (Rupp and Springsteen 2009b). Infestations will continue to be concentrated around disturbances and areas of use, such as trails, recreation sites, roads, mines, and other developments. Timely reclamation using desired native plant materials may be used to diminish the potential for non-native invasive plant species to become established at disturbed sites.

Alternative B would yield the lowest potential for introduction or spread of existing populations of NIP. Management under Alternative D would yield the highest potential for introduction or spread of existing populations of NIP. Severity of impacts from Alternative A (No Action Alternative) vary by subunit. Indicators used for impact analysis for NIP are the potential for increases or decreases in new non-native plant populations and density and extent of existing populations.

4.3.1.5.1. Effects Common to All Alternatives

Proposed management of the following resources, resource uses and programs would have no anticipated negative impacts to nonnative invasive species (NIS) management and will not be analyzed further: Air and Atmospheric Values, Cave and Karst Resources, Cultural and Paleontological Resources, Fish and Aquatic Species, Soil Resources, Special Status Species, Vegetative Communities, Visual Resources, Water Resources, Wilderness Characteristics, and Wildlife. Decisions to protect resources, particularly fish, wildlife, Special Status Species, Wilderness Characteristics and vegetation would benefit management of NIS by maintaining intact and undisturbed habitats and through stipulations to mitigate impacts from land use actions and maintain the function of these systems. Special designations (ACEC or WSR) would have positive impacts on NIS management, furthering prevention of introduction and spread of NIS.

Effects from Wildland Fire Ecology and Management

Impacts on NIS as a result of wildland fire and fire suppression activities are expected to be minimal within the planning area. NIP are the primary concern but other species could be introduced as hitchhikers on fire fighting equipment. Mitigation designed to reduce impacts of

wildland fire suppression activities that would directly introduce or create favorable conditions for NIP would include limitations on the use of dozer lines and off-road vehicles, rehabilitation of lines by replacing duff and soil, and use of weed free native plant materials when seeding or planting. Timely early detection and rapid response (EDRR) efforts in and adjacent to burn areas would be used to reduce impacts.

Forest and Woodland Products

Any disturbances caused by commercial or other authorized harvest of timber and forest products could contribute to the introduction and spread of NIS. A NEPA process, usually an environmental assessment (EA), is conducted for commercial harvest activities. Adverse consequences from NIP due to these activities are analyzed and appropriate stipulations are applied to the permit to mitigate impacts. Free-use permits are issued under a categorical exclusion to which special conditions can be applied. Although the area available for commercial uses varies among the subunits and alternatives, impacts to NIS are expected to be minor and successfully mitigated by permit stipulations.

Land and Realty Actions

Realty actions, such as rights-of-way, that result in the disturbance or removal of vegetation, create ideal opportunities for NIP to become established. Overland access to the disturbance creates a pathway for introduction of NIP from infested sites along highways. Equipment used for construction and maintenance may harbor seed or other NIS that could be dislodged and become established along access routes and at the disturbance. Designating utility and right-of-way corridors and avoidance areas, and locating new rights-of-way near existing rights-of-way, or on already disturbed areas whenever possible, would significantly reduce the potential for introduction and spread of NIP. Land use authorizations would also be analyzed on a project-specific basis, providing the opportunity to mitigate impacts through permit stipulations.

Introduction and spread of NIP can also occur in construction, maintenance, and reclamation projects where gravel, fill, and other materials are moved from a source area to public lands. Stipulations to authorized activities are and will be used to mitigate these methods of spread. A weed-free gravel (WFG) certification program is being developed in Alaska. If the program becomes viable during the life of the plan, stipulations to use WFG would be attached as appropriate to permitted activities using gravel and other fill materials.

NIS such as insects, pathogens, and other pests are often introduced as hitchhikers on vehicles, gear, and plant materials used in realty actions. The danger of NIS becoming established is compounded if vehicles, equipment, and gear used for these kinds of actions come from outside the region and state. Even though cleaning vehicles and equipment before it is transferred to public lands reduces the potential for introduction of NIS, opportunities to stipulated vehicle washing in permitted activities are limited due to distances from urban areas and the expense of remote washing stations.

Minerals

In general development of minerals would create disturbances, including pads, infrastructure, and roads, that would provide suitable areas for NIP to exploit. Oil and gas activities are expected to be limited to seismic exploration in the Steese subunit.

Recreation

Any recreational activity has the potential for introducing and spreading NIS. Recreational visitors often travel to the planning area from other parts of the state and country. Tents, footwear, packs, canoes, boats, and other gear can harbor seeds and invertebrates that are then dislodged and become established in new areas.

NIP are commonly introduced through use of contaminated hay and straw products. Travel by dog team and horse occurs in the planning area. NIP were found growing in straw debris at cabins accessed with dog teams in the White Mountains (L. Musitano unpublished, 2002) and at sites along the Dalton Highway where horses were feed hay. Hay is frequently fed at trailheads, rarely along the trail, however seed can be passed once pack animals enter public lands.

Permitted activities will include stipulations to use Alaska certified weed-free or locally grown forage and mulch (<http://www.plants.alaska.gov/invasives/weed-free.php>). As more producers successfully harvest certified crops, the use of certified hay and straw will become required more widely on BLM lands.

Boats powered either by inboard or outboard motors, and non-motorized boats can harbor non-native invasive plant and animal species. Boats are often brought onto public lands in Alaska from other regions of Canada and the U.S. by recreational users.

Outreach and public awareness efforts (brochures, interpretive and educational information, site regulations, the BLM website) can be developed to help prevent unintentional introductions of NIS. "Tread Lightly" and "Leave No Trace" practices promoted on BLM-managed lands reduce impacts of recreation on the landscape, which reduces removal or trampling of vegetation and diminishes opportunities for NIS to establish. Developed sites such as campgrounds, trails and public use cabins concentrate use and reduce the overall footprint from recreational activity and impact to NIS management. Special recreation uses would be analyzed on a project-specific basis and permits would include stipulations to mitigate impacts to NIS as appropriate.

Renewable Energy

Only small-scale renewable energy projects, and few of those, are anticipated in the planning area. Impacts to NIS would be similar to those for realty actions and would be mitigated by stipulations attached project-specific permits.

Travel Management

NIP infestations often follow transportation routes. Roadsides and trails are prime habitat for NIP species and vehicles, including OHV, are prime vectors for the introduction and spread of NIP along roads and trails. Vehicles import (and export) NIP seeds, often introducing previously unrecorded species. Any disturbance or use, including non-motorized, can contribute to introduction and spread.

Seeds of non-native plants can be imported or spread into an area if they become attached to OHV. Tests conducted by Trunkle and Fay (1991) demonstrate that seeds embedded in tires of four-wheel drive vehicles can be carried and deposited long distances from infested site. In their study, eight percent of the original number of seeds was still attached after the vehicle had driven ten miles. Continued heavy use of OHVs in an area and development or pioneering of new trails can reduce vegetation cover and expose soil, providing ideal conditions for NIP to establish (Gelbard and Belnap 2003; Christen and Matlack 2006).

Aircraft use in the planning area is generally unrestricted (with provision as described in travel management sections). The exception is within Primitive Zones in the Steese and White Mountain Subunits. Aircraft on wheels, skis and floats contribute to the spread of NIP when taking off from strips, ponds and lakes that are infested with NIP. Seeds and plant propagules can be collected on landing gear, struts and other parts of planes and are then dropped at landing strips, ponds or lakes (Johnstone et al., 1985).

Motorized boat use is generally allowed in the action alternatives for all subunits. Aquatic nonnative invasive species embedded in and on motors could be introduced to waterways within the subunits and readily move to areas outside the subunits along currents. The nonnative invasive aquatic plants *Purple loosestrife* and *Elodea nuttallii* are known to occur in Alaska and are most likely to be introduced by motorboats. Visitors to the state who bring motorized boats from other parts of the continent may cause introduction of other pests, such as Zebra mussel, into BLM managed areas open to motorized boat use. EDRR, outreach and education are the tools that will best mitigate introduction and spread of NIS.

4.3.1.5.2. Cumulative Effects

Past, present and reasonably foreseeable actions that are relevant to NIS management include climate change, wildland fire frequency, severity, use and suppression, fuel treatments, mineral management, population growth, recreation use, OHV use, realty actions, and NIS management efforts. The impacts expected to occur due to NIS infestations include loss of plant diversity, fish and wildlife habitat, soil integrity, and reduced ecosystem function. Climate change predictions, including longer frost-free seasons and thawing of permafrost, indicate that conditions may accelerate the ability of NIS to become established (Rupp and Springsteen 2009b).

Regional approaches to management of NIS, particularly NIP, through statewide efforts of the Alaska Committee for Noxious and Invasive Plants Management, the Alaska Invasive Species Working Group and Cooperative Weed Management Areas have been and will continue to be the most effective means of reducing cumulative impacts on adjacent lands. Many agencies are preparing statewide invasive species management plans. A NIP strategic management plan will be prepared as a step down plan from the Eastern Interior RMP.

4.3.1.6. Soil and Water Resources

Summary of Effects

Erosion of soils and subsequent instream sedimentation are the most important concerns for maintaining soil health and water quality in the planning area. A variety of resource uses and programs in this plan have the potential to result in direct adverse impacts to soil and water resources regardless of subunit and alternative. These include Wildland Fire Management, Lands and Realty, Mineral Development, Recreation Management and Travel Management. Other programs and resources that may have common benefits or some impact on soil and water resources are also discussed here.

Water and soils resources, for all subunits and all alternatives, would be managed to reduce soil-erosion, minimize impacts to soil profiles, and comply with State of Alaska water quality requirements. Permitted uses would be analyzed through the NEPA process and measures would be considered to protect and/or restore healthy functioning watersheds and minimize disturbance of soil resources.

4.3.1.6.1. Effects Common to All Alternatives

Effects from Air and Atmospheric Values

As the planning area is sparsely populated with no present or future plans for development of industrial facilities, it is anticipated that no substantial anthropogenic air-quality pollutants would originate from the planning area during the life of the plan. Long-range atmospheric transport of emissions from other countries (Shaw 1995), however, occurs periodically and may impair soil and water resources through deposition of airborne pollution, including mercury (Cahill 2003).

Effects from Cultural and Paleontological Resources

Impacts to soil and water resources from cultural and paleontological management are anticipated to be minor and should be similar across all subunits and all alternatives. Nonetheless, the discovery of cultural or paleontological resources could create temporary soil-disturbing activities and subsequent erosion at selected excavation sites. Excavation sites would likely be limited in extent and number, and thus, should not have major negative impacts on soils or water quality in the planning area. Soil and water resources would receive protection at selected sites where ground-disturbing activities would be restricted to preserve cultural and paleontological resources.

Effects from Fish and Aquatic Species

Measures to restore fish and aquatic species habitat, and to protect healthy watersheds would result in long-term beneficial impacts to soil and water resources. Under all alternatives, fish and aquatic species management decisions would strive to preserve or restore the quality of aquatic ecosystems, resulting in considerable protection for soil and water resources.

Under all alternatives in all subunits the preservation of fish and aquatic species habitat would continue to result in direct benefits to soil and water resources. Permitted activities that may impact aquatic habitat would be mitigated through ROPs. Under the action alternatives additional protective measures would include restricting surface disturbance in watersheds identified as Riparian Conservation Areas (RCAs). In all subunits the acreage that would be protected by RCAs is greatest in Alternative B and progressively less for Alternatives C and D. Under Alternative A, there would be no effect because RCAs were not identified.

Effects from Vegetative Communities and Invasive Species

Soil and water resources benefit where vegetation management supports healthy, productive, and diverse populations and communities of native plants and animals. Measures to protect and/or restore healthy functioning watersheds, riparian areas, and associated vegetative communities would minimize disturbance of soil resources and protect water quality (BLM 2009e). Implementation of measures to protect vegetation, both terrestrial and wetlands, on a project-specific basis, directly provide additional protection for soil and water resources. The implementation of ROPs and leasing stipulations which protect upland and riparian vegetation, contribute to water quality and healthy soils because vegetation can stabilize erosion-prone soils, and reduce sediment influx to streams. These beneficial effects from vegetation management would be substantially similar for watersheds in all subunits and across all alternatives.

Management measures to protect special status plant or animal species would have similar beneficial soil and water resource impacts under all alternatives. Special Status Species protection

would likely include minimizing permitted activities and/or restricting access in selected areas which would help reduce potential for disturbance of soils and possible water quality impacts.

Invasive species can adversely alter local ecosystems. Impacts may include species damage to native plant communities, increased soil erosion and sedimentation in streams, altered soil chemistry and nutrient composition, and reduced diversity of native plants (Hawkins 2000; Chapin et al, 2000). Functionally healthy and established natural plant communities are better able to resist invasions by alien plant species.

Invasive aquatic species are of particular concern in the planning area because of the vast number of waterways which could serve as invasive pathways. Aquatic invasive species can clog waterways, disrupt groundwater flows, degrade water quality, and lead to major changes in native plant and animal communities. Relatively few invasive aquatic species have been introduced and become established in Alaska compared to other states. This is in part due to Alaska's stringent plant and animal transportation laws, geographic isolation, northern climate, small human population, and relatively few concentrated disturbed habitat areas (ADF&G 2002a).

Most aquatic invasive species come from warmer climates, and few of these species are capable of surviving in Alaska's more extreme latitudes. However, the area south of the Brooks Range has a warmer climate, more developed land, more disturbed habitats, and better road access. These factors increase the likelihood of invasive species introductions (ADF&G 2002a).

Invertebrates that pose the highest potential threats to aquatic environments include, but are not limited to, the following: New Zealand mudsnail (*Potamopyrgus antipodarum*), Zebra mussels (*Dreissena polymorpha*), Signal crayfish (*Pacifastacus leniusculus*), and spiny water flea, tiny cladoceran or aquatic crustacean. Additional information on these and other nuisance species can be found online at http://www.adfg.state.ak.us/special/invasive/ak_ansmp.pdf.

The Alaska nuisance plant species that likely pose the most significant threat of introduction and spread in Alaska include: *Hydrilla verticillata*, hydrilla, water thyme; *Landoltia (Spirodela) punctata*, dotted duckweed; *Lythrum salicaria*, purple loosestrife; *Myriophyllum spicatum*, Eurasian water-milfoil (present); *Phalaris arundinacea*, Reed Canary grass (present); *Polygonum cuspidatum*, Japanese knotweed (present); *Spartina alterniflora*, salt marsh cordgrass; *Spartina densiflora*, dense-flowered cordgrass; and *Utricularia inflata*, swollen bladderwort.

Of further concern is didymo (or rock snot) *Didymosphenia geminata*. As described by the University of California Center for Invasive Species Research (2009), "Didymo or rock snot, is a highly invasive species of freshwater diatom that can form large and extensive mats in rivers, streams, and lakes. Didymo is native to cool temperate areas of the northern Hemisphere including Europe, North America, and Asia. Currently, didymo is expanding its range in North America and in addition to Alaska, its presence has been confirmed from Arkansas, Colorado, Idaho, Montana, New Hampshire, New York, North Dakota, South Dakota, Tennessee, Utah, Vermont, Virginia, Washington, West Virginia, and Wyoming; and in British Columbia and Alberta, Canada.

Outbreaks of didymo are thought to have contributed to the declines of freshwater invertebrate and vertebrate populations, especially fish that have important recreational value (e.g., trout fisheries). Didymo is almost certainly moved into new areas via contaminated fishing equipment (e.g., boots, waders, and line) and boats.

ROPs, combined with a preventative approach to the introduction and spread of NIS, would provide protection for soil and water resources.

Effects from Wilderness Characteristics

Healthy soil and water resources are essential components of wilderness. Management of areas to maintain wilderness characteristics would benefit soil and water resources by minimizing development and restricting surface-disturbing activities such as OHV use.

Alternative B results in the most lands managed for wilderness characteristics with progressively less wilderness acreage for Alternatives C and D. Under Alternative A, there would be no effect because no lands would be explicitly managed to maintain wilderness characteristics. Impacts would vary somewhat by subunit and alternative, but differences in effects to soil and water resources would likely not be discernible. Effects are expected to be the same for all subunits and alternatives.

Effects from Wildland Fire Ecology and Management

In all subunits and under all alternatives, wildland fire would generally be allowed to function in its natural ecological role with fire suppression activities undertaken only to protect life and property, site-specific values, or adjacent higher priority management areas. Wildland fire is an essential ecological process and natural agent of change in ecosystems. Wildland fires in Interior Alaska annually burn large areas and significantly impact soil and water resources on a landscape scale that far exceeds surface disturbance from BLM-authorized activities.

Under all alternatives, expected effects on soil and water resources from wildland fire would vary depending on several factors including topography, vegetation, permafrost, acreage burned, and fire intensity. Fire can stimulate new vegetative growth by helping maintain a mixture of vegetation types and age classes that provide soil stability, and by providing essential nutrients to the soil.

However, fires that heat soils to high temperatures can volatilize organics and produce a barren surface layer that contributes to higher rates of runoff and erosion. In general, removal of vegetation and some or all of the surface organic horizons deepens the active layer, increases effective overland flow, decreases infiltration, and produces warmer, drier soils.

Where permafrost soils are present, the amount of soil thaw after a fire is typically greatest at sites of intermediate wetness. Hence, the effect of wildland fire on Interior Alaska soils is somewhat dependent on the topography and location of the soils in a watershed. South-facing, upland soils, which are drier and permafrost-free, are not severely affected by wildland fire because they are relatively stable. Soils in the coldest (north aspect) and wettest regimes are not severely affected by wildland fire because most of the saturated organic mat and permafrost persist after fire (Ping et al., 2006). It is the marginal soils with permafrost and those located in potentially warmer, drier topographic positions, such as east and south aspect toe slopes, which are most likely to show major changes in moisture and temperature regimes after wildland fire (Swanson 1996). These changes may, in turn, change the soil classification from a poorly drained, permafrost-affected (Gelisol) to a well-drained, permafrost-free soil (Inceptisol; Viereck and Dyrness 1979, Dyrness and Viereck 1982, Moore and Ping 1989).

Wildland fire-related changes in water quality are primarily the result of soil erosion and deposition of soil materials into water (Neary et al., 2005). The extent of surface erosion after a fire largely depends on the topography and soil types of the immediate area, the amount of ice-rich frozen ground within the active layer, and the severity at which the fire burns the organic layer and underlying soils. Indirectly, wildland fires may also cause elevated streamflow

temperatures, increased pH values, and changed chemical concentrations, including increased nutrient flow into streams and lakes.

Possible impacts on soil and water resources from wildland fire suppression activities include compaction or disturbance of soils from equipment, camps, and roads and fire breaks where the soil has been scraped down to the mineral horizon with heavy equipment, as well as application of chemical retardants. Under all alternatives rehabilitation of areas disturbed by wildland fire suppression activities would reduce potential long-term impacts to soil and water resources. Measures to reduce the impacts of suppression activities include limitations on the use of tracked or off-road vehicles; measures to prevent the introduction of invasive or noxious plant species; establishment of buffer zones near streams and lakes; and rehabilitation of fire and dozer lines.

Effects from Forest and Woodland Products

Soil disturbance resulting from commercial or other authorized harvest of timber and forest products could contribute to soil compaction, erosion and influx of sediment to streams, and potentially, thermokarst formation. Roads and trails created for forest harvest may result in indirect impacts on soil and water resources by facilitating off-road OHV use. Impacts would depend on several factors including site characteristics, season, harvest area, and harvest techniques.

The low value of timber resources will generally limit the extent of roads and trails that would be economic to build for access. Assuming continued low level of forest product sales, expected impacts to soil and water resources would be short-term and of limited extent. Most alternatives allow commercial harvest in some areas where it was not allowed previously and access to timber could result from trails and roads built for other activities. Impacts to soil and water resources from forest and woodland products management should be minimal for all subunits and alternatives. Site-specific impacts to soil and water resources would be analyzed and appropriate stipulations and ROPs applied to permits to mitigate impacts.

Effects from Land and Realty Actions

There are anticipated impacts to soil and water resources from lands and realty actions in all subunits and under all alternatives, particularly in designated transportation corridors. Construction of access roads, railroads, bridges, culverts, and gravel pads in easements can adversely affect local water quality through soil erosion. Indirect impacts may result from removal of vegetation cover or excavation of permafrost soil. Thawing of fine-grained soil with high moisture content may result in ground subsidence, slope instability, and siltation of streams. Thawing fine-grained permafrost soils are subject to mass flow even on relatively gentles slopes. Thawing sand and gravel deposits usually remain comparatively stable.

Development of materials sites often results in permanent loss of soil and may increase siltation to local streams. Construction of bridges and culverts may create diversion of water and subsequent soil erosion and increased siltation in streams. Designating right-of-way corridors and avoidance areas and locating rights-of-way near existing rights-of-way, or on already disturbed areas whenever possible, would help mitigate adverse effects on soil and water resources.

All of the alternatives would address land fragmentation through land acquisition or disposal. Land tenure and land use decisions are not expected to have significant impacts on soil and water resources.

Effects from Fluid Leasable Minerals

All lands are presently withdrawn from fluid minerals leasing and there are no existing legal leases. Acreage is opened to leasing under each of the action alternatives with a progressive increase in number of acres open from Alternative B, to Alternative C, to Alternative D. Interest from industry is expected be limited due to the lack of BLM lands in high potential areas. Seismic exploration could occur in the Steese or Upper Black River subunits, but is unlikely during the life of the plan. A total of 20 miles of seismic line are anticipated on BLM lands.

Potential impacts from exploration/seismic related activities include damage or removal of the vegetation mat, thermokarst development, soil disturbance or water quality impacts. Nonetheless, adverse effects to soil and water resources from anticipated seismic lines would likely be negligible because seismic activity would occur during winter on frozen snow-covered ground. Impacts would be substantially similar across all alternatives and subunits. Leasing would not occur without further NEPA analysis.

Effects from Solid Leasable Minerals

All lands are presently withdrawn from solid minerals leasing and there are no existing legal leases. Acreage is opened to leasing in each of the action alternatives with a progressive increase in the number of acres open from Alternative B, to Alternative C, to Alternative D.

Potential impacts from exploration related activities could include damage or removal of the vegetation mat, thermokarst development, soil disturbance or water quality impacts. If development were to occur, impacts from solid leasable mineral (such as coal) activities could include possible erosion, decreased water quality, fugitive dust from gravel roads, and soil compaction from heavy equipment. However, no solid leasable mineral development is anticipated during the life of the plan as there are no economical deposits of these types of minerals.

Effects from Locatable Minerals

Locatable mineral operations expected to occur include development of one or two large lode mines, several small- and large-scale placer mines, and multiple suction dredge operations.

Lode Mines

Money Knob near Livengood, a large lode mine prospect, will likely be developed during the life of the plan. The Money Knob prospect is on state or private land. A second large lode mine could potentially be developed on private land. Large lode mines have a large associated area of surface disturbance, resulting in permanent change to the landscape. The mines typically have high levels of human activity on-site and often require large, high-standard road access with considerable traffic.

The potential water quality contamination risks associated with lode mines, would in part, depend on the level of sulfide minerals in the waste rock. It is too early in the life of the Money Knob mine to establish whether water quality would be adversely affected. Nonetheless, surface and groundwater quality could potentially be impacted in the area because of the generation of acid mine drainage from waste rock and mine-wall rock leaching. Acidity and level of contaminants in the tailings dam seepage water would be a long-term concern, requiring environmental monitoring.

Depending on availability of existing access to a mine site, new road and trail construction may result in substantially greater aerial extent of disturbance and greater long-term impacts to soils and water quality than the actual mine operation. Construction of roads and trails over permafrost areas may result in thermokarst (melting of ice-rich permafrost), obstruction or change in drainage, and subsequent long-term erosion of road material. The extent of soil disturbance from a mine operation varies considerably depending on access, mining methods, and watershed characteristics.

Impacts from roads can often be mitigated by such measures as restricting access to mine site workers only, limiting off-trail travel by mine workers, prohibiting hunting and off-trail use of OHVs, building the road in a manner which facilitates reclamation, and promptly closing and reclaiming the road following use.

Placer Mines

Placer mine exploration and development could occur on BLM lands on valid existing federal claims under any alternative. Historically, placer mining has occurred in the Fortymile and Birch Creek watersheds since the early 1800s and continues on federal, state, and private lands.

The majority of damage to Birch Creek and other gold-bearing watersheds occurred from dredges and draglines that mined entire valleys before environmental laws were enacted in the late 1980s.

The number of placer mining operations anticipated on BLM lands is predicted to be 37 to 67 small-scale placer mines and five to eight large-scale placer mines. Each small mine would have an anticipated total disturbance of 25 acres over the life of the mine. Large-scale placer mines are expected to disturb about 70 acres over the life of the mine. An estimated 925 to 1525 acres of surface disturbance from small mines and 350 to 560 acres of surface disturbance from large-scale placer mines are projected to occur.

Probable impacts to soil and water resources from placer mining were described in detail in the Birch Creek Placer Mining Final Cumulative EIS (BLM 1988a) and the Fortymile River Placer Mining Final Cumulative EIS (BLM 1988c). Impacts can vary considerably depending on factors including site characteristics, size of the disturbed area, and mining methods, but where placer mining operations utilize heavy equipment the following impacts could be expected.

Generally, placer mining can have an adverse effect on the structure of the existing soil profile by stripping of overburden and riparian/wetland vegetation. The usual procedure is for the overburden (including organic materials) to be stripped, coarse underlying materials separated from gold-bearing material in the processing plant, and fine materials discharged to a series of settling ponds with recycled water used by the processing plant. There is an irretrievable loss of any soil that enters waterways and is transported downstream.

Erosion of soils from non-point sources typically contribute to the sediment load of stream systems and may result from stream crossings, roadways directly adjacent to stream channels, and improved roads and trails which converge down-gradient to stream channels.

The primary impact to water quality from mining is an increase in sedimentation and turbidity. Some direct effects on water quality can be anticipated during the development stage of an operation due to the construction of settling ponds and stream bypasses, and through re-channelization of the stream. This would result in short-term increases in sediment levels and turbidity while equipment operates near or in the active stream channel.

It is likely that occasional high water or failure of water control structures would introduce sediments collected by the water treatment system into the stream channel. This would result in short-term increases in turbidity and sediment load levels and possible localized sedimentation of the stream substrate. The degree of impact would depend on the amount of material released and the streamflow at the time of release.

Channel morphology would be directly affected in all areas where activities associated with mining occur in the active channel; by-pass channels are usually constructed to allow mining in the active channel.

Indirect impacts to water quality would occur through non-point source erosion from disturbed areas associated with placer operations including access road and trails and equipment staging areas directly adjacent to stream channels. Channel readjustment would occur where the active channel was modified. These processes increase suspended sediment into the stream system, particularly during spring break-up and floods.

The impacts to soil and water resources could be expected to decrease after cessation of mining, successful revegetation of the disturbed areas, and the disturbed channel has stabilized. It is estimated that reestablishing vegetation on placer waste rock piles may take decades. The rate of succession (revegetation) seems to be heavily influenced by the proportions of particles of silt and clay size in the surface layer of the tailings (Rutherford and Meyer 1981).

The prevention of unnecessary or undue degradation of resources is required by 43 CFR 3809. Current regulations require all placer mine operations to recycle turbid water through settling ponds to prevent high turbidity discharge into streams and require reclamation of disturbed stream channels and riparian areas.

In the action alternatives, ROPs have been developed to reduce impacts to soil and water resources that may result from locatable mineral activities. Specific ROPs can be found in Appendix A, *Required Operating Procedures and Fluid Mineral Leasing Stipulations*. Additional mitigation measures, if necessary, could be developed during NEPA analysis of specific locatable mineral sites. Under all alternatives and subunits BLM would monitor water quality in selected streams and lakes to ensure that state water quality standards were met and would monitor in-stream flow to document changes in stream flow.

Suction Dredge

Suction dredge mining activities have the potential to affect soil and water resources, particularly if operations require access over steep terrain or permafrost soils where surface disturbance may result in increased erosion. Adverse impacts could result from equipment transport and storage, fuel spills, unauthorized expansion of existing OHV trail networks, as well as from compaction of soils at long-term camping sites associated with suction dredge mining operations.

A majority of the suction dredge operations in the planning area occur in the Fortymile River. The USGS conducted a systematic water quality study of the Fortymile River and many of its major tributaries in June of 1997 and 1998 (Wanty et al., 1999). Surface-water samples were collected for chemical analyses to establish regional baseline geochemistry values and to evaluate the possible environmental effects of suction-dredge placer gold mining and bulldozer-operated placer gold mining (commonly referred to as cat-mining). They concluded, based on water-quality and turbidity data, that the suction dredges had no apparent impact on the Fortymile River system,

although possible effects on biota were not evaluated. One of the three cat-mining operations monitored, however, had adverse impacts on local water quality and streambed morphology.

Effects from Salable Minerals

Future demand for salable minerals, primarily for road maintenance and construction, is not expected to vary substantially. Currently, there are about 160 acres of permitted material sites. It is anticipated that no more than 200 acres of authorized disturbance on BLM lands would be required to meet material demands over the next 20 years. The acreage open for salable minerals varies by alternative and subunit, but the general impacts to soil and water resources are common to all subunits.

Development of materials sites can unfavorably impact soil resources by compacting and/or removing soils. Material site characteristics vary by location but common methods for material extraction include drill and blast techniques in bedrock for rip-rap material and extraction and crushing of alluvial gravel for road material using heavy equipment. Material sites typically remain open for years. In locations where fine grain sediments are exposed, they can easily be eroded by wind and precipitation. Potential exists for increased siltation to local waterways resulting from erosion of soil and fine grained sediments from material site operations. Potential impacts would be reduced under all alternatives with implementation of ROPs and no substantial adverse impacts to soil and water resources are anticipated from management of salable minerals.

Effects from Recreation and Travel Management

Non-motorized recreation and OHV use within much of the planning area is expected to increase five to ten percent per year over the life of the plan. Impacts to soil and water resources increase with increasing levels of OHV use, especially in areas open to off-trail use. User-created OHV trail proliferation would result in increased erosion and stream sediment impacts. Potential adverse impacts to soil and water resources result from unimproved OHV stream crossings, heavy use of sites for camping along streams, and disturbance to riparian vegetation and stream banks.

Surface disturbance from construction of trails and roads on valley slopes and low areas containing ice-rich permafrost could result in formation of retrogressive thaw slumps which can have considerable long-term impacts on water quality.

The U.S. Fish and Wildlife Service (USFWS 2009c) described a nine-acre permafrost thaw slump on the Selawik River as follows: “In 2004, a large thaw slump occurred on the upper Selawik River in the Selawik National Wildlife Refuge in northwest Alaska. Since that time, the slump has transformed the once-clear river into a turbid one for more than 80 downstream river miles. Critical spawning habitat for sheefish—a large whitefish prized by subsistence and sport fishermen—lies 25 miles down river from the slump, generating concern that the heavy sediment might interfere with successful spawning and egg survival.”

Similar thaw slumps have been reported in the Yukon Territory, Canada (Rozell 2009). It is difficult to predict where and when thaw slumps may occur but resources managers should be aware they may occur, and can have substantial adverse impacts on water quality and aquatic habitat.

In all subunits, restricting OHV use to selected areas and trails, and limiting OHV weight would provide protection for soil and water resources. Recommended winter use (October 15 through

April 30) of snowmobiles with a limited weight would continue to provide opportunities for recreational users during the winter months, while protecting soil and water resources.

Potential impacts to soil and water resources would be reduced under all alternatives with implementation of ROPs (Appendix A, *Required Operating Procedures and Fluid Mineral Leasing Stipulations*). All recreation and transportation development decisions would be managed to reduce soil-erosion and minimize impacts to soil profiles, while water decisions would be managed to comply with State of Alaska water quality requirements.

Acreage open to OHV travel varies under each of the action alternatives, generally with a progressive increase in number of acres open from Alternative B, to Alternative C, to Alternative D. Hence, potential for degradation of soil and water resources is greatest under Alternative D.

4.3.1.6.2. Cumulative Effects

Total cumulative impacts to soil and water resources consist of past and current impacts; these are in addition to reasonably foreseeable future impacts in the planning area, regardless of whether these impacts were from private, state or federal actions. For all subunits and alternatives, any proposed resource development involving surface disturbance has the potential to cumulatively impact soil and water resources. In the planning area incremental cumulative degradation of soils and water resources within a watershed can occur, for example, through mining operations on selected stream segments. For each individual mining operation a small direct loss of soil and some small degradation of water quality are likely. As the number of mining operations increase in a given watershed the cumulative soil loss and cumulative impact to water quality can have long-term adverse impacts on soil stability, riparian habitat, fisheries habitat and water quality. Cumulative impacts can also result from repetitive use of an area, such as a single OHV stream crossing along a user-created trail. Minor disturbance may result from a single crossing, however, multiple use of an unimproved OHV stream crossing site can result in substantial cumulative impacts including soil compaction, damage to riparian vegetation, erosion along user-created trails and potential decrease in bank stability and local water quality.

Cumulative Effects from Climate Change

The magnitude and scope of climate change impacts to soil and water resources in the planning area are expected to be substantially greater (landscape level) than impacts from all other resource programs or permitted activities. In particular, increased annual air temperatures may substantially accelerate ongoing changes in wildland fire frequency and associated effects to soil (thermokarst) and water resources in much of Interior Alaska. Permafrost degradation associated with a warming climate is second only to wildland fires as a major disturbance to boreal forests (Jorgenson and Osterkamp 2005).

Interior Alaska is projected to become warmer and drier over the next century (Rupp and Springsteen 2009b). Climate change predictions include increased wildland fire frequency, longer frost-free seasons, and decreased water availability for transpiration, lake drying, and continued thawing of permafrost soils, with formation of thermokarst topography as areas of ice-rich permafrost melt. Permafrost melting would be expected to accelerate around disturbed areas where the insulating vegetation layer has been damaged or destroyed.

Much of the discontinuous permafrost in Alaska is within one to two degrees C. of thawing, and highly susceptible to thermal degradation (Doyle et al., 2000). Permafrost typically is capable of supporting heavy loads (at least on short time scales), but when permafrost thaws, the melting

of the ice can create voids in the ground and soupy mud flows (Davis 2001). Thaw ponds may develop from removal of vegetation. Permafrost degradation can cause changes in surface hydrology; particularly soil moisture levels, slumping of frozen stream banks, increased erosion, and myriads of other ecological impacts as the system adjust to these disturbances (Smith 2008). Degradation of permafrost is highly variable and its topographic and ecological consequences depend on the interaction of slope position, soil texture, hydrology, and ice content (Jorgenson and Osterkamp 2005).

Warmer temperatures and a longer growing season are expected to increase evapotranspiration enough to outweigh a regional increase in precipitation (Rupp and Springsteen 2009b). Hence, there is uncertainty whether the projected climate warming trend will contribute to an overall increase in wetlands or stream flow. According to Smith (2005), initial permafrost warming may lead to development of thermokarst and lake expansion, followed by lake drainage as the permafrost degrades still further. MacLean et al., (1999) found higher fluxes of dissolved organic carbon (DOC), dissolved organic nitrogen (DON) and dissolved inorganic nitrogen (DIN) into stream water from upland soils with extensive permafrost compared to areas with limited permafrost.

Thawing permafrost and the resulting microbial decomposition of previously frozen organic carbon is one of the most significant potential feedbacks to the atmosphere from terrestrial ecosystems in a changing climate. Schuur et al., (2009) found “areas that thawed over the past 15 years had forty percent more annual losses of old carbon than minimally thawed areas, but had overall net ecosystem carbon uptake as increased plant growth offset these losses. In contrast, areas that thawed decades earlier lost even more old carbon, a seventy-eight percent increase over minimally thawed areas; this old carbon loss contributed to overall net ecosystem carbon release despite increased plant growth. Their studies document significant losses of soil carbon with permafrost thaw that, over decadal time scales, exceeds increased plant carbon uptake at rates that could make permafrost a large carbon source in a warmer world.

Cumulative impacts to soil will likely include increased surface disturbance in the form of thaw slumps and thaw ponds and thermokarst topography; cumulative impacts to water resource are uncertain but a decrease in permafrost will affect levels of groundwater and river runoff as well as water chemistry. Over the life of this plan newly thawed permafrost areas will likely have a net uptake of carbon because increased plant growth would more than offset carbon loss from the melted permafrost. However, in the long-term (>20 years), release of carbon from continued melting of permafrost would likely contribute to increased atmospheric carbon dioxide and climate warming.

Cumulative Effects of Land and Realty Actions

Cumulative impacts to soil and water resources from land and realty actions include past and current impacts and reasonably foreseeable future impacts in the planning area from private, state or federal actions. For all subunits and alternatives proposed land and realty actions that involve surface or stream disturbance have the potential to cumulatively impact soil and water resources.

There are no expected future changes in access to military lands or state lands. There are relatively few BLM transportation corridors within the 30 million-acre planning area. Cumulative effects of land and realty actions on BLM lands would likely be minor compared to actions on state and private lands.

Cumulative Effects of Locatable Minerals

Placer mine development has occurred in the Steese, White Mountains, and Fortymile subunits since the early 1800s using a variety of mechanized methods including dredges, draglines, dozers and excavators. The soil profile is typically destroyed for long periods in areas of active dredging or sluicing, and shorter term impacts of soil compaction and alteration in areas of facilities, roads, and trails. Water quality is often degraded by increased siltation, depending on site characteristic and the type of mining operation.

The total disturbed area from historic placer activity on BLM-managed lands in the planning area is estimated at 7,500 acres. The action alternatives in this RMP would lift mineral withdrawals in selected areas, potentially resulting in development of new access roads and mine operations. However, a substantial portion of the projected mining would likely occur in previously mined areas. Depending on the Alternative, development of an estimated 37 to 67 small-scale (20 to 30 acres) placer mines and five to eight large-scale (60 to 80 acres) would be expected on BLM managed land during the life of the plan.

In its 2007 Mineral Industry Report, the Alaska Division of Geologic and Geophysical Surveys (DGGS), lists 81 separate companies or individuals that were estimated to be producing gold in the planning Area (Szumigala et al., 2008). The amount of acreage on state and private land that has been disturbed or reclaimed by mining operations within the planning area is uncertain.

Two large-scale lode mines, Pogo and Fort Knox, are in operation on state lands within the planning area. Two additional large lode mines may be developed within the planning area on state or private land within the life of this plan. One potential lode mine “Money Knob,” is located near the town of Livengood along the western boundary of the White Mountains subunit. A second potential lode mine, LWM, is located about 35 miles northwest of the town of Chicken in the Fortymile subunit. If potential lode mines are developed, varied impacts to soil and water resources would be expected depending on type of mine development and ore processing methods.

Cumulative Effects of Recreation and Travel Management

The effects of past, present and future actions, including the increasing demand for recreational use of trails and rivers, creates changes to the landscape as a result of surface-disturbing activities, which often have cumulative impacts on soil and water resources. Continued use of OHVs on unauthorized user-created trails can reduce vegetation cover and expose soil. Exposed compacted soil surfaces reduce the infiltration of rain water and snowmelt.

The demand for recreational trails and OHV use is anticipated to increase by about ten to fifteen percent over the life of the plan. Consequently, a similar increase in surface disturbance could be expected. Lands adjoining the planning area are managed by federal, state, Native, and private entities. This is why the rules and regulations governing land and resource use may differ. Cumulative adverse effects to soil and water resources, however, would likely not exceed the anticipated demand for recreation and resources because no major new recreation or commercial developments are likely during the life of the plan. Proliferation of user-created OHV trails along the planning area boundaries would remain a concern. Where soil and water resource standards were not being met, permitted activities and practices would be modified to meet the standards. The nature of the modifications would be based on site-specific circumstances.

4.3.1.7. Special Status Species

Summary of Effects

Although the habitats of sensitive animal species vary considerably, surface-disturbing activities in riparian and wetland habitats would have the greatest potential negative effects on sensitive animal species because many sensitive species are dependent on these habitats. Few activities are predicted to occur which would directly impact the habitat type which supports most sensitive plant species (dry, steep, south-facing slopes), but these habitats may be susceptible to establishment of NIP, which could be facilitated by allowed activities. Climate change is likely to affect populations of sensitive plant and animal species. Even though some may be affected positively, most effects would be negative because sensitive species populations typically have lower resilience to change. Localized impacts to sensitive species from allowed activities may occur, and in general those impacts will increase from Alternative B to C to D. However, it is not anticipated that any alternative would trend any species towards the need for federal listing under the Endangered Species Act.

4.3.1.7.1. Effects Common to All Alternatives

The effects of management alternatives on the BLM-Alaska sensitive species of plants, wildlife, and fish/aquatic animals would be generally similar to those described for those species groups in the Vegetative Communities, Wildlife, and Fish and Aquatic Species sections. Notable effects on sensitive species or groups are also discussed in those sections.

Wetland, riparian, and aquatic habitats support most of the sensitive animal species. Trumpeter swan, olive-sided flycatcher, blackpoll warbler, rusty blackbird, Alaskan brook lamprey, Alaska endemic mayfly, a mayfly (*Acentrella feropagus*), and a stonefly (Alaska sallfly) are BLM-Alaska sensitive species that are dependent on these habitats. The Alaska tiny shrew may also occur more frequently in riparian habitats. All action alternatives open significant areas to placer mining, which could result in substantial local impacts to riparian and aquatic habitats and species, although in varying degrees. Alternatives that maintain water quality and limit impacts to riparian habitats will best minimize impacts to sensitive animal species. Riparian Conservation Areas (where established) will reduce impacts to riparian and aquatic habitats. Requirements in all action alternatives to develop specific reclamation measures and monitor and report achievement of reclamation in plans of operations may increase reclamation success and reduce impacts.

Several sensitive aquatic animal species might be affected by BLM management. One fish species (Alaskan brook lamprey) and two insects (Alaska endemic mayfly and Alaska sallfly) occur in the planning area. A third insect is not known to, but, may occur, in the planning area (*Acentrella feropagus*, a mayfly). The lamprey is not known to occur in waters on BLM lands, but has been documented near BLM lands in the Chatanika and Chena drainages. The planning decision most likely to impact sensitive aquatic species is the lifting of locatable mineral withdrawals, as it would allow increased levels of placer mining that could degrade riparian areas, stream habitats, and water quality. However, the increase in placer mining is expected to be moderate and result in mostly localized impacts. The Alaska endemic mayfly is known only from a single specimen collected on lower Birch Creek WSR near the Steese Highway bridge. It is expected to be found widely in the area, but additional inventories of adult mayflies will be necessary to confirm this. The Birch Creek WSR is closed to locatable minerals, and lands open to locatable mineral entry are far upstream from the Steese Highway bridge. For all subunits except the White Mountains (closed to locatable minerals), the expected impact to fish and aquatic resources (including BLM-Alaska sensitive species) from locatable minerals would be highest for Alternative D, and progressively less for Alternatives C, B, and A. Under no alternative are allowed activities likely to result in a trend toward federal listing for any of these species.

Several sensitive terrestrial animal species might be affected by BLM's management and are discussed below.

Osgood's arctic ground squirrel—This species is likely found only in dry, open habitats near Circle and in the Steese and Upper Black River subunits (such as steep south-facing slopes and river bluffs, grasslands, and burned areas). It may benefit from activities that remove mature tall vegetation or promote low, early-successional habitats (such as timber removal, prescribed fire). Negative effects could occur from permanent loss of habitat (e.g., facilities development); however, this is not expected at a scale that would influence populations. No alternatives are expected to cause a trend toward federal listing of this species.

Alaska tiny shrew—This species occurs in low density within a variety of habitats, but is most common in riparian shrub habitats. It has been documented to occur in the Steese NCA near Twelvemile Summit. Widespread activities that clear large areas of vegetation could negatively impact this species. Mining could have localized effects to shrew habitat, but would not likely occur at a scale or degree to cause a trend toward federal listing.

Three sensitive passerine bird species, olive-sided flycatcher, rusty blackbird, and blackpoll warbler, are widely distributed in the planning area. All are associated to some extent with riparian or wetland habitats. Occurrence of these species in other habitats is dispersed enough that anticipated activities are unlikely to impact any of them at a population level. Alternatives that minimize impacts to riparian and wetland habitats will reduce impacts. Of the three species, the rusty blackbird is most dependent on wetlands. Recent drying of lakes and ponds may be responsible for recent population declines and this trend may continue, making protection of remaining lake and pond habitats more important for conservation of this species. However, suitable lake and pond habitats in the planning area are quite rare on BLM lands relative to areas such as Yukon Flats and Tetlin National Wildlife Refuges, so it is very unlikely that any alternative could result in population-level impacts to this species.

Trumpeter Swan—Few trumpeter nests occur on BLM lands in the planning area (26 of 7,787 swan observations occurred on BLM lands during the 2005 statewide aerial surveys). A ROP (Appendix A, *Required Operating Procedures and Fluid Mineral Leasing Stipulations*) that limits human disturbance within one-quarter mile of trumpeter swan nests will limit impacts to the few trumpeter swan nests in the planning area. Only large-scale activities among lakes and ponds in the Mosquito Flats area could affect more than a few nesting trumpeter swans. Although forest product harvest and mineral development would be allowed in this area under all alternatives, no large-scale activities are expected.

Two sensitive raptors, golden eagle and short-eared owl, are uncommon but widely distributed across the planning area during summer. Both occur in predominantly open (non-forested) habitats. Golden eagles nest primarily in suitable cliffs (which can be very limited in availability) while short-eared owls nest on the ground. The golden eagle is a priority raptor in this plan and the ROPs in Appendix A will limit the impact of approved activities on nesting golden eagles (assuming that adequate inventory has occurred to identify most golden eagle nests). The short-eared owl is not considered a priority raptor species and nest sites are less readily identifiable and more likely to change from year-to-year, making it difficult to apply similar protective measures. However, suitable nest sites for the short-eared owl are also much less limited, and the owl is less sensitive to disturbance from human activity. In addition to ROPs, the Bald and Golden Eagle Act (and implementing rules enacted by the USFWS) will subject approved activities near golden eagle nests to a high level of scrutiny. Potential impacting uses

include recreational activities near nest sites (especially along river cliffs), large-scale mining operations, improperly designed powerlines, towers, or similar structures, and high levels of summer off-road vehicle use. The relatively low densities of eagles and short-eared owls on BLM lands in the planning area and the low level of activities predicted will likely lead to low impacts to populations of either species in any alternative.

Most BLM sensitive plant species occur in habitats with specialized conditions such as: steep south-facing dry bluff habitats; moist alpine herbaceous sites; rocky ridges, slopes, and scree; and calcareous rocks or soils. Potential impacts to sensitive plant habitats occur mostly from summer OHV use, road and trail construction, and large mineral developments in upland habitats (such as large lode mines). Alternatives that allow locatable and leasable mineral development (or other activities that may create new roads and trails) and also allow cross-country OHV use in the same areas represent greater potential impacts to sensitive plant species. In addition to direct impacts, these activities are likely to facilitate the spread of non-native invasive plants, which may be the largest potential impact to sensitive plant species. Large areas are opened to locatable and leasable minerals in all action alternatives; alternatives that close areas to cross-country OHV use will limit the potential effects from mineral development and other activities.

Given that effects from allowed activities would remain fairly discrete and localized, and that most habitats in the planning area would remain in natural condition, it is not anticipated that any alternative would trend any sensitive species toward federal listing. An increased emphasis on monitoring these species and their habitats is advisable to confirm management effectiveness and trend predictions.

4.3.1.7.2. Cumulative Effects

The effects of activities allowed under the various alternatives on BLM lands will combine with similar activities on adjacent lands to impact sensitive species. Increased inventory and monitoring is necessary for reliable assessments of impacts. Climate change is predicted to create major changes in vegetative composition on the landscape and changes in ecosystem processes, and also effect the health of individual species. Even though climate change could benefit some sensitive species, those faced with unfavorable conditions may have limited ability to adapt due to specialized habitat requirements, small populations, and lack of connectivity to suitable habitat. Increasing regional prevalence of non-native species will combine with other changes, including incremental improvement in access for motorized vehicles, to increase potential negative effects on sensitive species.

4.3.1.8. Vegetative Communities

Summary of Effects

Of the program decisions analyzed here, only Cave and Karst Resources and Cultural and Paleontological Resources have no anticipated impacts to vegetation. Management to maintain several other resources will generally benefit natural diversity of vegetative communities, including Soil and Water Resources, Special Status Species, Vegetative Communities, Visual Resources, Wilderness Characteristics, and Subsistence. Management of Non-Native Invasive Species and cleanup of Hazardous Materials and Abandoned Mine Lands will generally benefit vegetative communities. Wildland fire is the major determinant of vegetative communities in the planning area. A natural fire regime is considered desirable and is maintained for most of the planning area through the “Limited” Management Option in interagency fire management

plans. The effects of several resource uses are anticipated to be small due to little activity expected, including Forest and Woodland Products, Solid Leasable Minerals, Salable Minerals, and Renewable Energy.

The primary decisions affecting vegetative communities would be the opening of large areas to locatable and leasable minerals and summer OHV management. In Alternative C, the most predictable change in activity would be an increase in placer gold exploration and mining occurring in areas opened to location. This would result in areas of impact to riparian habitats as well as impacts to vegetation related to road and trail access. In Alternative C, summer cross-country travel by OHVs would generally not be allowed (except in the Upper Black River Subunit where use is very low) and this would greatly reduce impacts from OHV use and greatly reduce the potential spread of non-native invasive plants (NIP) with cross-country OHV use. Climate change is predicted to result in major changes to vegetation in the next 30 years as wildland fire frequency increases. Activities which facilitate the spread of NIP would compound the effects of climate change and an expected regional increase in prevalence of NIP.

4.3.1.8.1. Effects Common to All Alternatives

Effects from Air and Atmospheric Values

If lightning-ignited wildland fires are suppressed to minimize smoke effects on public health, recreation, communities, or tourism; a deviation from the natural fire regime could occur as a result, with resultant effects on vegetative communities.

Effects from Fish and Aquatic Species

Riparian areas typically support some of the most diverse and productive plant communities, and riparian vegetation is critical for proper stream functioning—providing bank stability, shading, capture of insulating snow, instream woody debris, and other functions. Even though none of the BLM-Alaska sensitive species plants in the planning area are known to occur specifically in riparian habitats, aquatic plants are not well studied and some rare aquatic species could occur. Riparian plant communities make up a very small portion of the landscape on an area basis but, contribute greatly to vegetative community diversity. All alternatives contain some measures to minimize impacts to fish and aquatic species habitat. In action alternatives, Riparian Conservation Areas (RCAs) and High Priority Restoration Watersheds utilize stream buffers to minimize disturbance to riparian vegetation, especially stream bank vegetation. The extent of these designations vary by alternative. ROPs (Appendix A, *Required Operating Procedures and Fluid Mineral Leasing Stipulations*). Reclamation objectives established for all action alternatives to maintain fisheries and aquatic habitats will also benefit vegetative resources. Once disturbed, stream bank vegetation can take decades to recover due to instability of the stream channel caused, in part, by loss of protective vegetation. Decisions to protect riparian communities (including vegetation) would result in the most protection under Alternative B.

Effects from Non-Native Invasive Species

Non-native invasive plant species (NIP) have had major impacts on vegetative communities and ecosystems outside of Alaska. The potential impact that introduction and spread of non-native plants has on vegetative communities is large and exceeds the potential impacts from other surface-disturbing activities identified in this planning process. Yet introduction of non-native plants most often occurs in conjunction with surface-disturbing activities. The success of planning and management decisions in controlling the introduction and spread of non-native

invasive species will be a primary factor in minimizing effects from BLM actions on the whole. Requirements for weed-free hay and mulch, certified weed-free seed, and certified weed-free gravel sources will do much to limit potential for establishment of NIP. Planning decisions will also affect the use of motorized vehicles, which can play a major role in spread of NIP. Cross-country OHV use, especially in recently burned areas, may represent the largest potential impact to vegetative communities, through spread of NIP.

Effects from Soil Resources

All action alternatives contain measures to limit impacts to soil, which in turn limit impacts to vegetation.

Effects from Special Status Species

Provisions to conserve special status plant species (which are common to all action alternatives) will aid in maintaining the full diversity of species present in the planning area, including unique or unusual plant communities. Surveying for BLM-Alaska sensitive species plants in areas where they potentially occur prior to activities which may impact sensitive plant species will reduce the potential for impacts.

Effects from Vegetative Communities

Vegetation management goals and decisions apply to all action alternatives. Their implementation will aid in maintaining the health, productivity, and diversity of plants and plant communities. Many ROPs (Appendix A, *Required Operating Procedures and Fluid Mineral Leasing Stipulations*) are focused on minimizing surface disturbance, encouraging natural revegetation or use of native seed, and reducing introduction and spread of NIP; they will reduce potential impacts to vegetative communities in all action alternatives.

Effects from Visual Resources

Maintaining lower VRM classes will generally be of benefit to vegetative communities, due to reduced levels of surface disturbance and lower levels of associated human activities. VRM class may be used as one indicator of management beneficial to vegetation.

Effects from Water Resources

Maintenance of water quality and natural hydrologic functions will benefit vegetation. All alternatives provide measures to protect water quality.

Effects from Wilderness Characteristics

Other planning decisions which maintain wilderness characteristics (such as maintaining naturalness and opportunities for solitude) will generally benefit vegetative communities by minimizing surface disturbance. Acres of land on which wilderness characteristics will be maintained can be an indicator of management beneficial to vegetation.

Effects from Wildland Fire Ecology and Management

BLM-Alaska has recognized fire as an essential ecological process and natural agent of change to ecosystems. A large majority of BLM lands in the planning area have the Limited fire management option where wildfire is considered to have natural resource benefits, and a near-natural fire regime will result. However, areas near the road system and communities are

typically within Modified, Full, or Critical management options and wildland fire suppression will artificially modify the fire regime in these lands. Human-caused fires (which occur more frequently near the road system) can alter fire regimes; however, the BLM policy is to actively suppress all human-caused fire. The BLM decisions that alter management in an area can also result in changes to wildland fire management. An increase in public presence and establishment of human infrastructure often leads to more wildland fire suppression efforts which can cause abnormal deviations to the fire regime. Effects to vegetation of a longer fire return interval include older stand ages, changes in community composition, trend towards less productivity and growth, and larger areas of similar vegetation.

Sensitive plant species are generally either adapted to fire or occur in habitats where wildland fire occurs rarely. Wildland fire control activities such as camps or constructed firelines could impact sensitive plants. Most sensitive plants occur in alpine areas or on steep south-facing slopes—habitats in which wildland fire suppression activities are unlikely to occur.

Effects from Wildlife

Management guidance and ROPs to minimize impacts to wildlife habitats will benefit vegetative communities.

Effects from Forest and Woodland Products

Harvest of wood products can have major effects on vegetative communities, although assumed low levels of harvest will result in minor impacts at the planning area scale. In some aspects and under certain situations, forest harvest can have effects similar to wildland fire, including increase in vegetation productivity and growth. In some situations, timber harvest can be done with minimal effect (e.g., selective or salvage harvest during winter with adequate snow cover). Potential impacts of forest harvest include: loss of vegetation cover, conversion of vegetation to an earlier successional stage, introduction of non-native invasive plant species, and roads and trails built for access. Regeneration of tree species can sometimes be delayed by heavy grass cover following harvest. Roads and trails created for forest harvest can result in both direct and indirect impacts on vegetation, including facilitating recreational off-road OHV use and creation of additional roads and trails.

In Alternative A, commercial forest harvest is not allowed in the White Mountains NRA or Steese NCA while commercial sales could be considered in the Fortymile and Upper Black River subunits. Action alternatives allow commercial forest harvest in greater portions of the planning area than Alternative A, including almost the entire planning area in Alternative C. Despite the large area available, it is assumed that only three to five small biomass projects could occur during the life of the plan. Assuming continued low level of forest product sales (three free-use permits and one small sales vegetative contract during past 10 years), impacts of forest products on vegetation are anticipated to be low in all alternatives. As a result, few forestry-specific resource protection guidelines have been developed in this RMP. The low value of timber resources will generally limit the extent of roads and trails which are economic to build for access. However, most alternatives allow commercial harvest in some areas where it was not allowed previously and improved access to timber could result from access built for other activities. Sensitive plant species are not typically found to occur in commercial forest habitats, but may occur in routes used for access.

Effects from Lands and Realty

Permits for uses of BLM lands may involve uses and activities which will impact vegetation, but those activities will generally be guided by ROPs and leasing stipulations (Appendix A, *Required Operating Procedures and Fluid Mineral Leasing Stipulations*) and the remaining effects will be analyzed and may be reduced during the permitting process. There are no right-of-way exclusion areas in the planning area. Rights-of-way impacts would be similar to those discussed under “Effects from Locatable Minerals.” Lands which are found to contain sensitive plant species could be transferred out of BLM management if not identified for retention.

Effects from Fluid Leasable Minerals

Leasing of minerals is not anticipated during the life of the plan; should it be proposed, it will be analyzed in a separate NEPA document. Seismic exploration for oil and gas could occur in at least some alternatives and would have direct impacts on vegetation, including potentially BLM-Alaska sensitive species plants. Direct destruction of vegetation occurs with clearing of seismic lines. Vegetation in seismic lines have been shown to be quite slow to recover (USFWS 2008a, section 4.11.1.1). Lines may be used by summer and winter OHVs, which can exacerbate impacts and slow or prevent vegetation recovery. A total of 20 miles of seismic line is anticipated to be constructed on BLM lands within the life of the plan, most likely in the Steese or Upper Black River subunits. Impact to vegetation of this amount of activity would be mostly local in nature.

Effects from Solid Leasable Minerals

Although leasing of coal would not occur without additional NEPA analysis and a land use plan amendment, exploration activities could occur in any areas open to leasing. In addition, coal inventory and exploration could also be approved in areas closed to leasing. Considerable surface disturbance may occur with exploration for coal (e.g., 250 x 250 foot trenches, 50 x 40 foot drill pad sites). Exploration for coal, if any, is anticipated to occur only in the Eagle Field (in the northern Fortymile Subunit). No leasing or exploration of other solid minerals is anticipated due to lack of known occurrence of economic quantities in the planning area. In the unlikely event that leasing of other solid minerals would occur, impacts to vegetative communities could be similar to that of large lode mines described below.

Effects from Locatable Minerals

Locatable mineral extraction operations expected to occur in the planning area include small- and large-scale placer mines, suction dredging, and large-scale lode mines (although no large-scale lode mines are anticipated on BLM lands). Impacts include direct loss of habitat from the operations and access routes, and changes in human use of the area from changes in access.

Suction dredging may impact riparian vegetation through long-term camping activities, and may disturb and/or displace wildlife in the immediate vicinity of the operation, but typically does not impact riparian vegetation directly. Travel to and from suction dredge operations may impact vegetation, depending on available access.

Placer mines typically disturb both riparian and near-stream vegetation, and also disturb the stream channel which may result in downstream effects on riparian vegetation. Placer mining typically results in a change from late seral to early seral community types. Recovery of habitats from placer mining is highly variable and may be very slow. It is dependent on success in saving of topsoil and organic matter, proper re-spreading in a timeframe that maintains live seeds and vegetative parts, and establishment of vegetation on topsoil and fine-grained materials before they are washed away. Aufeis formation resulting from disturbance of stream hydrology can result

in spring water flow in places that are well above the normal stream level and this could erode topsoil before revegetation occurs. Late melt of aufeis can also prevent or slow vegetation growth. Instability in the stream channel as a result of mining could also affect aquatic and riparian habitats downstream of the mine site. More discussion on stream-channel and downstream effects of placer mining can be found in the Fish and Aquatic Species section 4.3.1.4. It may require 50 years or more (following end of mining) in some areas for riparian area habitat quality to approach pre-mining conditions. Some mine sites remain in operation for many years, with a portion of the mine area disturbed for the duration of mining. Reclamation often does not proceed as planned due to changing of operators, or financial or logistical difficulties.

The number of small-scale placer mining operations on the BLM lands in the planning area is predicted to range from 42 to 67 and the number of large-scale placer mines from six to eight during the life of the plan (dependent on alternative) and occur mostly in the Fortymile and Steese subunits (section 4.2.1 Analytical Assumptions). Assuming 25 and 70 acres disturbed in small- and large-scale placer mines, respectively, over the life of the mines, this will result in an estimated direct surface disturbance of 1,050 to 1,675 acres of small- and 420 to 560 acres of large-scale placer mine disturbance. These prediction for each alternative has no upper or lower bounds identified — actual numbers could be much higher or lower. Although these areas represent very small proportions of the planning area, placer operations concentrate impact on high-value and relatively uncommon stream riparian and aquatic habitats. Placer operations also will be concentrated in limited areas, and affects will persist beyond the life of this plan. In addition, the access to mine sites can cause surface disturbance and indirect impacts to many more acres than the mines themselves. Roads and trails for mining access often occur in or near riparian areas and involve multiple stream crossings.

In addition to the direct loss of habitat from road construction surface disturbance, roads and trails can cause changes to adjacent habitat including melting permafrost, obstruction or change in drainage, aufeis formation, erosion of road material, and dust deposition on adjacent vegetation or snow. Invasive species are frequently spread along roadways and by motorized vehicles. The roads and trails may also be utilized for purposes other than mining. Roads facilitate access by summer and winter OHVs to surrounding areas which may previously have been remote and inaccessible.

Impacts from roads can often be mitigated by measures such as limiting public use and off-road travel, building the road in a manner which facilitates reclamation, and promptly closing and reclaiming the road following use. However, roads frequently become open for public use and are often not closed or reclaimed.

Exploration for locatable minerals may cause vegetation disturbance. During helicopter supported exploration, trees are cleared for helicopter landing sites. If the site is close enough to a road system to make road-building economical, roads may be built to each drill site, which would involve substantially more surface disturbance. Placer exploration may involve trenching and drilling, but would not normally impact the stream channel. Roads and trails built for exploration will create impacts similar to those used for mining (see above) except that they may be reclaimed immediately and thus involve lesser impact. Since mining companies do not necessarily share exploration data, multiple exploration operations could occur in the same area, extending impacts over multiple years or intensifying impacts within a year.

Winter equipment moves will normally be conducted with snow and frozen ground depths adequate to prevent major impacts. Some damage to vegetation, however, will inevitably occur

(especially taller vegetation), and in some vegetation types and soils, heavy equipment moves can produce long-term changes to soils and vegetation. Jorgenson et al., (2010) found that some seismic camp move trails on the north slope on ice-rich, fine-grained soils remained disturbed after 25 years (and likely permanently) because of changes in hydrology caused by ground subsidence, despite minimum protective snow cover and frozen soil depths. Winter moves can also create or maintain trails used by OHVs.

Effects from Recreation

In general, recreation management units which allow and promote greater recreational use and access (especially motorized access) will have greater potential impacts to vegetation. In SRMAs, progressively greater disturbance of vegetation is expected on a continuum from Primitive to Semi-Primitive, Backcountry, Middlecountry and Frontcountry RMZs. ERMAs allow dispersed use and are typically remote (and although summer motorized use is allowed, relatively little occurs). Recreational facilities impact vegetation directly (such as during construction) as well as indirectly through visitor use on or near the facility. The effects will depend on area of disturbance, the level of use and habitat. High levels of visitors can impact vegetation by trampling, especially in areas where use is concentrated such as near facilities. Recreationists using motorized vehicles typically have larger impacts to vegetation, both in area impacted and degree of modification as described below.

Effects from Travel Management

Winter OHV Use

Oversnow vehicles (snowmobiles) weighing less than 1,000 pounds curb weight are generally allowed throughout the planning area during winter months (October 15 through April 30) except in Research Natural Areas. When and where there is adequate snow cover, snowmobiles create little impact to vegetation. Recreational snowmobilers typically do not travel in areas of low snow cover because it can be uncomfortable and hard on equipment. Shrubs and small trees may be damaged or killed when overrun by snowmobiles. The low vegetative mat is not typically impacted, but may be damaged in spots where a machine's track was spun excessively. Repeated travel on trails can pack snowcover, decreasing insulation value of the snow and in some places cause subsurface water flow to occur on the surface and "glaciating" to occur. The later melt of this ice in spring can impact vegetation growth. In general, impacts to vegetation from snowmobiles will be low in all alternatives and noticeable impacts will be limited to local areas of heavy use.

Cross-Country Summer OHV use

OHVs impact vegetation in as little as one to a few passes and a visible "trail" is created when vegetation is crushed and broken. Shrubs such as willow and dwarf birch are especially susceptible (Ahlstrand and Racine 1993). Ten controlled passes of a small three-wheeler caused shrub breakage and herbaceous plant compression, damage to sedge tussocks, and surface depression. With additional passes, or with shearing from tires or track cleats, ground cover vegetation and organic material became disturbed, eventually exposing mineral soils and mixing organic and mineral soils (Ahlstrand and Racine 1993). With compression from OHVs, the insulative properties of the vegetation and organic layer are reduced and the depth of thaw is increased. In permafrost soils, this removal or compression of vegetation and organic matter can lead to thermokarsting and erosion. Vegetative cover and composition may change in trails (with

sedges and grasses often favored over other plants) or vegetation may be totally lost in the trail tread. The depression of the surface of the trail often leads to capture and rerouting of drainage.

When enough OHV passes occur to create visible trails, those trails tend to attract further use, leading to a network of user-created trails which vary from lightly traveled and barely visible to heavily traveled and bare soil or deep ruts. The BLM has attempted to manage some of these trails to improve condition and reduce impacts to resources. Alternatives B and C propose many of these trails as “designated” or “existing” and propose that summer OHV use be limited to these trails.

Trails with exposed soil serve as routes of spread for non-native plant species, including invasive species. It is very difficult to monitor for initial colonization of non-native species along a user-created network of scattered trails — and even more difficult to monitor large areas that are subject to dispersed cross-country travel. Invasive species not detected soon after establishment may be difficult or impossible to eradicate. Dispersed cross-country travel which does not result in soil exposure represents little risk of spreading invasive plant species. Where soil is exposed, risk increases. After fires, mineral soil is either already or easily exposed so that dispersed cross-country travel creates a much greater probability of establishment of invasive plant species. Several studies have shown that roads and trails serve as conduits for movement of plant species and that vehicles are capable of distributing large amounts of weed seed (Gelbard and Belnap 2003, Christen and Matlack 2006, Rooney 2005, Hansen and Clevenger 2005).

Wildland fires in 2004 and 2005, which burned large areas of all subunits, removed brush and tree branches, making travel through previously inaccessible areas possible. Downed trees in some burned areas may make it more difficult to travel cross-country. When vegetative ground cover and organic matter is burned, trails are established after fewer passes of an OHV. OHV travel which removes remaining organic material may induce erosion, delaying or preventing recovery of vegetation from fire.

The increasing size and capability of OHVs also create increased capability of simply driving over and through small and medium-sized vegetation, including small trees, creating new trails that would not have been possible in the past without first clearing vegetation. On non-forested well-drained ridgetops and areas of alpine tundra, soils may be more resistant to change by OHVs, but vegetation may be removed with repeated passes, and runoff-induced erosion can result without adequate water control. When use is dispersed, a distinct trail may not be formed, but the cover and composition of vegetation over a larger area may will result. Lichens, in particular, are sensitive to damage from one to a few passes with OHVs. The single passage of an OHV over dry lichens has been observed to all but eliminate them (Ahlstrand et al., 1988), and lichens continue to be rare in disturbed areas on the North Slope after 30 years (Felix and Raynolds 1989).

Recovery of vegetation on an OHV trail can be very slow and permanent changes can result. Once the organic mat is destroyed, sites may continue to degrade even after use ceases. Subsidence and erosion may prevent revegetation. Some sites may revegetate, but with a different species composition, leaving trails visible for decades.

Allowance of cross-country travel by OHVs larger than 1,000 pounds curb weight would result in increased impacts to vegetation (Alternative A in most of Fortymile and all of Upper Black River subunits and Alternatives C (for game retrieval) and D in Fortymile subunit). Larger and heavier vehicles (even if they have similar ground pressures) disturb wider tracks of vegetation, create deeper tracks, and cause deeper and wider thaw bulbs (Racine and Ahlstrand 1991).

OHV use on designated or existing trails

Most current OHV trails in the planning area are user-created trails. The primary benefits of limiting use to existing or designated trails (Alternatives B and C in all but the Upper Black River Subunit) are in limiting the continuing proliferation of new user-created trails, limiting damage to vegetation from cross-country OHV use, and allowing management and re-routing of existing trails. Although some vegetation impacts will occur because use will be concentrated on existing trails (such as trail braiding in boggy areas), these impacts will be small relative to damage from cross-country travel.

Constructed trails can have characteristics and effects similar to small roads (especially those built for UTVs). The existing vegetation community is removed, usually in a tread at least twice as wide as the vehicle. If constructed trails are not designed to manage surface water flow across them (or adequately maintained), ponding or erosion will result. Constructed trails also often convert subsurface water flow into surface flow, changing plant habitat near the trail. OHV use on existing constructed and managed sustainable trails will result in little impact to vegetation beyond that caused during construction (except for potential spread of non-native invasive plant seed). Constructed trails will decrease braiding and loss of vegetation through erosion, but will typically be wider than existing non-braided two-track trails. Constructed trails can be sited in less harmful locations. In all subunits except the Upper Black River, constructed trails will replace some existing unmanaged trail, and benefits to vegetation will generally accrue.

Under Alternative C, travel off of existing or designated trails to retrieve downed game will be allowed. This will create the same types of impacts described above under Cross-country Summer OHV Use. However, the damage to vegetation will be only a small fraction of that which would occur when the entire area allowing limited motorized use is open to cross-country travel. Not only is the use limited to hauling of meat, but must occur near existing/designated trails. In the Fortymile subunit, where UTVs would be allowed, greater impacts to vegetation would occur in Alternatives C and D.

OHV effect on BLM-Alaska sensitive species plants and riparian and wetland vegetation

Cross-country summer OHV use (which is allowed in all alternatives in the Upper Black River Subunit and Alternatives A and D in all other subunits) could impact BLM-Alaska sensitive species plants (Table 3.6, "BLM-Alaska Sensitive Species and Watch List Species Plants") as well as other rare plant species. Most of the known locations of sensitive plant species are either in areas closed to summer OHV use, in areas that are currently remote enough to not see OHV use, or in areas where OHVs would generally not access, such as steep, south-facing river bluffs or alpine scree. However, some sensitive species, such as *Poa porsildii* and *Montia bostockii*, in the upper South Fork Birch Creek, are found in terrain that (except for remoteness) would easily be traversed by summer OHVs and adversely impacted. The sensitive species *Ranunculus camissonis* is found in the headwaters of Champion Creek in the White Mountains NRA, in an area once open to summer OHVs. Limiting OHV use to existing trails greatly reduces the area potentially impacted by OHVs to just a small fraction of that possible with cross-country use. It also allows new trails to be sited to avoid sensitive plants or rare plants and plant communities.

Wetland habitats are especially sensitive to disturbance by OHVs. Disturbance, such as OHV use leading to trail development will result in a direct removal of wetland vegetation. Depression of the insulative mat over permafrost soils can result in thermokarsting. Saturated soils are less resistant to shearing of the organic material and experience hydraulic pumping, which disturbs soil structure. On low-slope terrain, expanding bogs often result. As users divert around these boggy trails, they damage vegetation and create the same cycle, resulting in expanding bogs or

an expanding network of braided trails. Any depression in the ground surface can collect and channel water and lead to alteration of drainage patterns.

Riparian vegetation may be sensitive to damage by OHVs, depending on soils and vegetation. Stream bank vegetation is often critical for channel stability. Streamflow may initiate cutting of a new channel where riparian vegetation is removed, especially during high water events. Uncontrolled OHV use along stream channels or banks may damage riparian vegetation and bank structure, resulting in alterations in stream structure and stream sedimentation. At stream crossings, vegetation is removed and widening of the channel often occurs. This change can affect auefis formation. Diversion of some or all of the stream flow down the trail sometimes occurs at stream crossings. Impacts from stream crossings can be largely eliminated with well-planned and constructed trails combined with limiting of OHV use to those trails.

Area and extent of OHV impacts on vegetation

The proportion of the large areas currently open to motorized use on which vegetation is currently impacted by OHVs is unknown, but likely less than one percent. This area might be considered inconsequential on an ecosystem scale. However local impacts may be substantial where use is heavy. In addition, trails and their use may have impact more significant than the area they occupy, because negative impacts are often focused in sensitive or important habitats such as wetlands, riparian areas and streams, and because effects can occur beyond the trail surface--such as from establishment of non-native invasive species.

Studies conducted in Wrangell-St. Elias National Park and Preserve documented that the average OHV trail had an impact area 34.6 feet wide (Connery 1984, as cited in Meyer 2002), or 4.2 acres/mile. Where use is not confined to trails, such as in non-forested, dwarf shrub habitats, dispersed use may impact a large area without creating clearly defined trails. Under Alternatives A and D, cross-country OHV use will continue to be allowed and new trails will continue to be created. Few trails will recover as long as use is allowed. Few limits will be placed on the creation of new trails or damage to existing trails. The area of visibly affected ground is predicted to increase by ten to twenty-five percent in 10 years under Alternatives A and D, but there is little certainty in this estimate.

Effects from Special Designations

New ACECs were proposed (Alternatives B, C, and D) to protect wildlife (especially sheep and caribou) and fisheries values. ACEC management will reduce potential impacts to vegetation through closing or placing restrictions on locatable and leasable mineral development, restricting motorized vehicle use, and other provisions.

All existing WSRs with "wild" and "scenic" river classifications will be maintained in all alternatives. Management of "wild" and "scenic" rivers will tend to maintain the vegetation in largely undisturbed state and surface-disturbing activities are generally minimal ("wild" segments are withdrawn from mineral entry). Designation of new segments under Alternative B will similarly serve to maintain vegetative values.

Effects from Hazardous Materials and Abandoned Mine Lands

Cleanup of existing hazardous materials and prevention of new spills or deposits will benefit vegetative communities by reducing potential long-term effects and by allowing timely revegetation of the site. Rehabilitation of abandoned mine lands will result in revegetation of

disturbed sites. In the cleanup process, disturbance of vegetation may cause short-term impacts to vegetation, but typically this will be offset by long-term benefits of a rehabilitated site.

Effects from Subsistence

The management of federal lands to maintain subsistence resources will benefit wildlife habitat and vegetative subsistence resources. Harvest of vegetative resources by federally qualified subsistence users may impact vegetation, but such harvest is typically non-destructive (such as berry picking) and very limited in extent. Use of motorized vehicles by federally qualified subsistence users could impact vegetation in a manner similar to other motorized vehicle use and will be subject to the same regulations, with very limited exceptions conducted under a permit.

4.3.1.8.2. Cumulative Effects

Climate change will result in major changes in vegetation composition across the planning area. The frequency of wildland fires is predicted to increase and result in a shift from a mature spruce-dominated landscape to one dominated by deciduous forest and shrub. The greatest amount of change will occur within the next 30 years (Rupp and Springsteen 2009b). Treeline will continue to rise with warming temperatures. This rise has been slow (Lloyd 2005), but relatively rapid rises have been documented in some places in the region (Danby and Hik 2007). The growing-season climate is predicted to become drier (despite a predicted slight increase in precipitation) due to an increase in evapotranspiration related to higher temperatures. As a result, white spruce in many sites will suffer increased drought stress (Barber et al., 2000), reduced growth, and insect attack. The effects of drought stress will further reduce the prevalence of mature white spruce forest, unless other habitats become more conducive to white spruce growth. The effect of spruce bark beetle infestation in southcentral Alaska has been a dramatic decline in white spruce. Drying and shrinking of some wetlands may continue. The regional prevalence of non-native plant species will continue to increase, resulting in greater potential for spread onto BLM lands.

Extreme weather events are predicted to increase in frequency and result in a variety of changes. For example, Bokhorst et al., (2009) documented extensive damage to sub-arctic dwarf shrub vegetation in Sweden following a winter warming event in which temperatures warmed to seven 7 degrees C. during December 2007. In Interior Alaska, recent extremely dry summers have resulted in several record fire years.

The increase in OHV usage could be greater than expected (analysis assumptions are five to ten percent per year increase). The number of registered OHVs in Montana increased 2.6 times in eight years (Youmans 1999); off-highway motorbike/ATV registrations in Idaho increased 23 times between 1983 and 2003 (USDA, Forest Service 2004); and the nationwide population of OHVs increased by 2.7 times in 10 years (1993 to 2003, Cordell et al., 2005). Coupled with other factors such as attraction of OHV users to constructed trails, increasing off-road capabilities of OHVs, the possibility for population growth in the Fairbanks area, the effects of wildland fires, and creation of new access (roads and trails) for mining, recreation, and utility corridors, the impact of OHVs on vegetation could increase substantially in areas open to cross-country travel. Access tends to increase incrementally, as roads and trails are extended from existing roads and trails, and both roads and trails tend to become larger and improved.

Large lode mines are not predicted to occur during the 20-year life of the plan on the BLM lands in the planning area. Two large lode mines are predicted to occur, one of which (Money

Knob near Livengood) includes 26 federal mining claims, but no other BLM lands. However, additional lode mines in the area, including BLM lands opened to mineral entry, could potentially occur, either within the life of the plan or later. Large lode mines have a large area of surface disturbance, permanent change to the landscape, high levels of human activity, and typically require large, high-standard road access with considerable traffic. Access may be requested across BLM lands for mines located on non-BLM lands, resulting in direct and indirect impacts.

Increased wildland fires, increased regional prevalence of non-native species, climate change, a developing transportation network, and increasing OHV usage may all combine to create substantial effects on vegetation both directly and from enhancing conditions for spread of non-native invasive species. All action alternatives open large (but variable) proportions of the BLM lands in the planning area to locatable and leasable minerals. Limiting OHV use to existing/designated trails (Alternatives B and C) will reduce potential impacts from the combination of these factors compared to Alternatives A and D.

4.3.1.9. Visual Resources

Summary of Effects

Effects to visual resources come from activities resulting in surface disturbance such as mining, trail construction, or facilities development due to changes in line, color, and texture on the landscape. Temporary field camps associated with a variety of activities would temporarily impact visual resources by introducing different colors into a predominately green and brown landscape. Both wildland and prescribed fires affect the visual resource by changing line, color, and texture of burned areas in contrast to the surrounding unburned areas. Proper management of air quality, soils, vegetation, fish and wildlife would generally protect or enhance visual resources.

VRM Classes outline the level of change that could occur within that class. Identifying an area as a specific management class does not guarantee that change will take place. The discussion below identifies the impacts that may occur to the landscape from each resource if development or management activities occur. However, the potential for every acre to lose visual quality due to management in a specific VRM Class is extremely low.

The Visual Resource Inventory Classes described in Chapter 3 will be used as a base of comparison since it represents the existing condition (IM 2009-167; July 7, 2009). The table below shows the results of the VRM Inventory for the entire planning area (Appendix D, *Visual Resource Inventory*) and the acres in each BLM VRM class.

VRM Class	VRI Class (acres)	Alternative B (acres)	Alternative C (acres)	Alternative D (acres)
Class I	291,000	347,000	343,000	317,000
Class II	19,547,000	3,286,000	626,000	16,000
Class III	2,098,000	42,000	1,157,000	951,000
Class V	9,019,000	3,060,000	4,610,000	5,451,000
Total	30,955,000	6,736,000	6,736,000	6,736,000

4.3.1.9.1. Effects Common to All Alternatives

Effects from Temporary Field Camps

The BLM uses temporary field camps for management and inventory activities associated with many programs. These field camps may temporarily impact visual resources by introducing

different colors into a predominately green and brown landscape. Field camps would be less than one acre in size and generally last fewer than two weeks in any one location. If viewed from an elevated viewpoint, these activities may attract the attention of a casual observer in the Foreground-Middleground and Background zones. As viewed from ground level, these activities may attract the attention of a casual observer in the Foreground-Middleground Zone.

Effects from Air and Atmospheric Values

Decisions in this plan will protect and enhance the quality of air resources associated with BLM lands. All direct or authorized emission generating activities will comply with federal and state air quality laws and regulations. The BLM will also implement interagency wildland fire smoke effects mitigation measures and consider smoke effects in all fire management activities. These actions would continue to promote visually clear skies over BLM lands, thus maintaining good visibility. Air flow from adjacent countries may impact visual resources by reducing visibility as pollutants increase. These impacts could affect all distance zones.

Effects from Cultural and Paleontological Resources

Destructive cultural resource data recovery and scientific use such as excavation and extensive subsurface testing has the potential to impact visual resources by removing vegetation and changing landform characteristics at each site. The browns of disturbed soils and the natural revegetation process would continue to impact color for long-term. Texture contrasts between soils and adjacent vegetation would also be impacted for the long-term. If viewed from an elevated viewpoint, these activities may attract the attention of a casual observer in the Foreground-Middleground and Background zones. Viewed from ground level, these activities may attract the attention of a casual observer in the Foreground-Middleground Zone.

The removal of significant paleontological resources may have the same impacts on visual resources as described above for cultural resources.

Effects from Fish and Aquatic Species, Including Special Status Species

Active rehabilitation efforts, such as willow plantings, seeding and fertilizing would have positive impacts to areas with surface disturbance. Other rehabilitation efforts such as recontouring the floodplain and returning the stream channel to a more natural functioning condition would result in changes to line, form, color and texture. Rehabilitation efforts would result in the area being returned to a more natural looking landscape. The size and scope would depend on the size of the project.

Effects from Soil Resources

Returning lands to pre-disturbance conditions will enhance visual resources by returning disturbed lands to a more natural landscape by blending with surrounding landscape in line and form. There may be a temporary increase in sedimentation that will impact water clarity during restoration activities. The browns of disturbed soils and the natural revegetation process would continue to impact color for long-term. Texture contrasts between soils and adjacent vegetation would also be impacted for long-term. If viewed from an elevated viewpoint, these activities may attract the attention of a casual observer in the Foreground-Middleground and Background zones. Viewed from ground level, these activities may attract the attention of a casual observer in the Foreground-Middleground Zone.

Effects from Water Resources

Monitoring activities, such as snow courses, stream gauges and permafrost research sites would generally go unnoticed by the casual observer except if viewed in the Foreground-Middleground Zone. Restoration projects to improve water quality may have impacts on line, form, color and texture while returning the disturbed landscape to a more natural appearance over the long-term.

Effects from Wilderness Characteristics

The maintenance of wilderness characteristic would enhance visual resources by limiting surface disturbance activities and managing for a natural landscape. Allowance of temporary structures, public use cabins, and other small facilities, such as dispersed use campsites, would impact visual resources primarily through changes to color from the matte greens of natural vegetation to other colors of buildings. Texture and form impacts would include changes from irregular, random textures of vegetation to smooth, definite geometric shapes of buildings. If viewed from an elevated viewpoint, these activities may attract the attention of a casual observer in the Foreground-Middleground and Background zones. Viewed from ground level, these activities may attract the attention of a casual observer in the Foreground-Middleground Zone.

Facilities development would be guided by the VRM class objectives assigned for the area where development would occur. Proper design and construction techniques can reduce visual impacts from facilities and help maintain a more natural appearing landscape. If viewed from a higher viewpoint, facilities in the Foreground-Middleground Zone would attract the attention of the casual observer. Depending on size, facilities in the Background Zone may also attract the attention of the casual observer. As viewed from ground level, only facilities in the Foreground-Middleground Zone would attract the attention of the casual observer.

Visual characteristics are related to the criteria used to determine the presence of wilderness characteristics which includes naturalness. Management decisions to preserve wilderness characteristics help to preserve the visual resources of the area by limiting surface-disturbing activities and maintaining natural vegetation and landform.

Effects from Wildland Fire Management

Both wildland and prescribed fires affect the visual resource by changing line, color, and texture of burned areas in contrast to the surrounding unburned areas. Line would change from a more regular, smooth line to a irregular, jagged line along the adjacent burned and unburned area within the Foreground-Middleground Zones. Short-term color impacts would be expected in burned areas until revegetation occurs. Fire can enhance color over time by creating more diversity in the hues and colors associated with a more diverse vegetation composition. Vegetation texture can change from a medium to fine, compact texture in natural areas to a coarse, sparse texture in burned areas as a result of fire. Burned areas, if viewed in the Foreground-Middleground and Background zones, would attract the attention of the casual observer. Both wildland and prescribed fires impact visual resources by reducing visibility by smoke. These impacts may last only a day but could last longer. Fire suppression activities cause impacts to visual resources by introducing changes in color, texture, and line to a natural landscape. Colors change from the various hues of green vegetation and predominately brown soils and organic materials. Texture changes from a natural medium, subtle texture of vegetation to a coarse, rough contrast of disrupted soils and organic materials. Changes in line from the irregular, weak line of the natural landscape to a regular, strong line between natural vegetation and human-constructed fireline could occur. If viewed from an elevated viewpoint, these activities may attract the attention of a casual observer in the Foreground-Middleground and Background zones. As viewed from ground level, these activities may attract the attention of a casual observer in the Foreground-Middleground Zone.

Rehabilitation of the fireline, which decreases the color contrast, a line contrast may be long-term depending on the vegetation composition between the undisturbed natural area and the disturbed fireline. These impacts may attract the attention of the casual observer in both the Foreground-Middleground and Background zones.

Other treatments such as mechanical fuel reduction using select cut, shaded fuel break pile and burn would have limited impact to visual resources since removal of vegetation is selective and generally appears natural. Treatments such as chemical, dozer lines and hydro axe would have greater impacts to vegetation, resulting in changes to the landscape in line, form, color and texture. Line changes from an irregular line to a more straight line where vegetation is removed, form changes from irregular to more regular appearing in the area of vegetation removal, color changes from various hues of diverse vegetation to a more uniform color of grasses as large woody materials are removed, and texture changes from an irregular texture of diverse plant communities to a more uniform texture of grasses or low woody plants. If viewed from an elevated viewpoint, these activities may attract the attention of a casual observer in the Foreground-Middleground and Background zones. As viewed from ground level, these activities may attract the attention of a casual observer in the Foreground-Middleground Zone.

Effects from Forest and Woodland Products, including Subsistence

Timber, firewood, and forest products harvest (e.g., birch bark), including for subsistence purposes, can impact line, form, color, and texture. The removal of trees changes the density of vegetation, a characteristic of texture. Changes in line from the irregular, weak line of the natural landscape to a regular, strong line between natural vegetation and the harvest area is dependent on the harvest technique used. Form changes from the irregular shape of the vegetation to a regular geometric shape from removal of vegetation. Changes in color would occur from the deeper hue of trees to the more diverse colors of lower growing vegetation. Clear-cuts would have the greatest impact, while select cutting would have the least impact. Depending on size, timber harvest activities may attract the attention of the casual observer in the Foreground-Middleground Zone, Background Zone, and even the Seldom-Seen Zone.

Effects from Lands and Realty

The acquisition of lands with high resource values and the consolidation of public land holdings will enhance visual resource management by reducing inholdings and scattered parcels. Consolidation would eliminate the possibility of unmanaged development activities on private land surrounded by BLM lands and would reduce the number of isolated parcels managed by the BLM. Land disposal would impact visual resources by transferring ownership from the BLM into state-management or private ownership where possible development may occur. Development would cause changes to line form, color and texture to the landscape and vegetation.

Most of the visual impacts from land use authorizations, such as leases and rights-of-way, would be from the clearance of vegetation and support structures for pipelines, power lines, communication sites, and weather stations. These would impact visual resources by introducing straight, vertical and horizontal lines into a multi-shaped landscape. Color impacts would include changes from the matte greens of natural vegetation to glossy reflective colors of metal structures and other colors of facilities such as buildings. Texture and form impacts would include changes from irregular, random textures of vegetation to smooth, definite geometric shapes of buildings and straight lines of the right-of-way corridor. If viewed from an elevated viewpoint, these activities may attract the attention of a casual observer in the Foreground-Middleground and

Background zones. Viewed from ground level, these activities may attract the attention of a casual observer in the Foreground-Middleground Zone.

Permits for temporary shelters would impact visual resources primarily through changes to color from the matte greens of natural vegetation to other colors of buildings. Texture and form impacts would include changes from irregular, random textures of vegetation to smooth, definite geometric shapes of buildings. If viewed from an elevated viewpoint, these activities may attract the attention of a casual observer in the Foreground-Middleground and Background zones. Viewed from ground level, these activities may attract the attention of a casual observer in the Foreground-Middleground Zone.

The removal of unauthorized use structures would improve visual resources by eliminating the buildings' impact to the existing landscape characteristics of line, form, color and texture and allow the disturbed area to return to a natural state.

Effects from Renewable Energy

Land use authorizations for wind energy, solar energy and biomass utilization activities may result in impacts to visual resources. Most of the visual impacts would be from support structures for wind generators or solar panels, and vegetation harvest and would impact visual resources by introducing straight, vertical lines into a horizontal landscape. Color impacts would include changes from the matte greens of natural vegetation to glossy reflective colors of metal structures and other colors of facilities such as towers. Some facilities may be reflective or shiny making them more visible from long distances. Texture and form impacts would include changes from irregular, random textures of vegetation to smooth, definite geometric shapes of buildings. If viewed from an elevated viewpoint, these activities may attract the attention of a casual observer in the Foreground-Middleground and Background zones. Viewed from ground level, these activities may attract the attention of a casual observer in the Foreground-Middleground Zone.

Effects from Fluid Leasable Minerals

Impacts associated with the seismic exploration for oil and gas would primarily be connected to temporary support facilities, survey work and overland moves. Temporary structures (e.g., weatherports, housing mounted on sleds), vehicles (e.g., rolligons, track rigs), aircraft, and human presence and associated activity would create minimal short-term impacts on visual resources. Impacts from exploration activities such as seismic line clearing of vegetation, would be primarily be changes to line, form, color and texture. Visual resources will be protected by the use of VRM class objectives and the visual contrast rating process during authorization of fluid minerals activities. If viewed from an elevated viewpoint, these activities may attract the attention of a casual observer in the Foreground-Middleground and Background zones. Viewed from ground-level, exploration activities may attract the attention of a casual observer in the Foreground-Middleground Zone, but would be undistinguishable in the Background and Seldom-Seen Zones.

A longer lasting impact would be “green trails” resulting from overland moves or seismic exploration. These trails are not always visible for the entire route. These “green trails” are quite visible from the air to the casual observer versus on the ground where they become more difficult to recognize. If viewed from an elevated viewpoint, these activities may attract the attention of a casual observer in the Foreground-Middleground and Background zones. Viewed from ground level, these activities may attract the attention of a casual observer in the Foreground-Middleground Zone.

Effects from Solid Leasable Minerals

Impacts to visual resources by exploration, development and production of solid leasable mineral resources would depend on the scale of the action. Changes to line, form, color and texture of the natural landscape would result from activities such as trenching, road building for access, vegetation clearing for exploration activities, and mineral extraction processes. Mining operations would have the greatest impact to visual resources impacting line, form, color, and texture of mined areas, with the removal of vegetative cover and stockpiled materials creating form contrast between the mined areas and the stockpiled materials and the background landforms. Mining and material stockpiles would also create color contrast between the greens of vegetation and the browns of soils. Texture would change from a natural medium, subtle texture of vegetation to a course, rough contrast of disrupted soils and organic materials. Changes in line from the irregular, weak line of the natural landscape to a regular, strong line between natural vegetation and disturbed landscape could occur. Buildings and other facilities would impact primarily line, color and texture by introducing straight lines in an irregular landscape and color into a predominately green landscape. If viewed from an elevated viewpoint, these activities may attract the attention of a casual observer in the Foreground-Middleground and Background zones. Viewed from ground level, these activities may attract the attention of a casual observer in the Foreground-Middleground Zone.

Effects from Locatable Minerals

The impacts from the extraction of locatable minerals would vary depending on the methods used and size of operation. Although not predicted to occur on BLM lands over the life of the plan, large lode mining operations would have the greatest potential impact— impacting line, form, color, and texture of mined areas— with the removal of vegetative cover and stockpiled materials creating form contrast between the mined areas and the stockpiled materials and the background landforms. Mining and material stockpiles would also create color contrast between the greens of vegetation and the browns of soils. Texture would change from a natural medium, subtle texture of vegetation to a course, rough contrast of disrupted soils and organic materials. Changes in line from the irregular, weak line of the natural landscape to a regular, strong line between natural vegetation and disturbed landscape could occur. Changes in form from a natural landscape would occur where material is extracted from the ground and a resulting terraced pit is created. Typical footprint for this type of operation would be approximately 2,000 acres, plus any access road. If viewed from an elevated viewpoint, these activities may attract the attention of a casual observer in the Foreground-Middleground and Background zones. Viewed from ground level, these activities may attract the attention of a casual observer in the Foreground-Middleground Zone.

Smaller lode mining operations would have similar impacts as large lode mines, but the typical footprint would be approximately 600 acres, plus any access road. If viewed from an elevated viewpoint, these activities may attract the attention of a casual observer in the Foreground-Middleground and Background zones. As viewed from ground level, these activities may attract the attention of a casual observer in the Foreground-Middleground Zone.

Large-scale placer mining (semi-mobile plant) would have the greatest impact to visual resources impacting line, form, color, and texture of mined areas, with the removal of vegetative cover and stockpiled materials creating form contrast between the mined areas and the stockpiled materials and the background landforms. Mining and material stockpiles would also create color contrast between the greens of vegetation and the browns of soils. Texture would change from a natural medium, subtle texture of vegetation to a course, rough contrast of disrupted soils

and organic materials. Changes in line from the irregular, weak line of the natural landscape to a regular, strong line between natural vegetation and disturbed landscape could occur. Typical footprint for this type of operation would be five to twenty acres plus any access road. If viewed from an elevated viewpoint, these activities may attract the attention of a casual observer in the Foreground-Middleground and Background zones. Viewed from ground level, these activities may attract the attention of a casual observer in the Foreground-Middleground Zone.

Smaller placer mining (full-mobile plant) would have similar impacts as large-scale placer mines, but the typical footprint would be 4.4 acres plus any access road. If viewed from an elevated viewpoint, these activities may attract the attention of a casual observer in the Foreground-Middleground and Background zones. As viewed from ground level, these activities may attract the attention of a casual observer in the Foreground-Middleground Zone.

Suction dredge operations would have the least impact, but would still impact visual resources through the development of above ground support structures. Support structures from any support facilities would also impact line, form, color, and texture by introducing vertical lines from buildings into a predominately horizontal landscape. Colors would contrast between the greens of vegetation and the building colors. Buildings introduce a smooth texture into a more coarse texture of the vegetation, as well as a more geometric square or rectangular form into the more random and irregular form of the landscape.

Depending on size, mining activities may attract the attention of the casual observer in the Foreground-Middleground, Background, and even in the Seldom-Seen zones.

Effects from Salable Minerals

Impacts from the extraction of salable minerals would vary depending on the methods used and size of operation. Effects on color, texture, and line would be the same as those described above for locatable minerals due to removal of vegetative cover and stockpiled materials. If viewed from an elevated viewpoint, these activities may attract the attention of a casual observer in the Foreground-Middleground and Background zones. Viewed from ground level, these activities may attract the attention of a casual observer in the Foreground-Middleground Zone.

Effects from Recreation

Recreation Management Zones (RMZs) are managed for different physical settings which include remoteness, naturalness and visitor facilities. Of these, naturalness and visitor facilities impact visual resources by setting prescriptions for management, i.e., describing the amount of naturalness and how facilities will sit on the landscape. These prescriptions range from Primitive, Semi-Primitive, Backcountry, Middlecountry, Frontcountry, Rural and Urban, each with different levels of naturalness and description of how facilities will sit on the landscape.

New development of recreational facilities, such as campgrounds, trail heads, and kiosks would impact visual resources by introducing straight vertical lines and smooth textures into a predominately horizontal, random landscape. Increased use of existing and new facilities would introduce different colors into a predominately green and brown landscape. Some of the facilities may be reflective or shiny instead of the more subtle colors of vegetation, making them more visible from long distances. Buildings and other structures introduce a more geometric square or rectangle form into the more random and irregular form of the landscape. Facility development would be guided by visual resource management class objectives assigned for the area where development would occur. Proper design and construction techniques can reduce visual impacts

from recreation facilities and help maintain a more natural appearing landscape. If viewed from a higher viewpoint, facilities and recreation activities in the Foreground-Middleground Zone would attract the attention of the casual observer. Depending on size, facilities in the Background Zone may also attract the attention of the casual observer. Viewed from ground level, activities in the Foreground-Middleground Zone may attract the attention of the casual observer.

Impacts to visual resources from special recreation permits would be reduced by the use of VRM class objectives and the visual contrast rating process. The use of “Leave No Trace” and “Tread Lightly” practices would help protect visual resources. The size and scope of impacts are dependent on the size and scope of the proposed activity. If viewed from an elevated viewpoint, these activities may attract the attention of a casual observer in the Foreground-Middleground and Background zones. Viewed from ground level, these activities may attract the attention of a casual observer in the Foreground-Middleground Zone.

Effects from Travel Management

Impacts from non-motorized forms of travel such as horses, mountain bikes and foot travel are primarily to color from the damage to vegetation and the resulting soil disturbances. Some changes to texture and line may occur with repeated travel over the same area or route, resulting in an artificial straight line in an otherwise irregular landscape.

Impacts from OHV use as a result of unrestricted overland travel include changes in form, line, color, and texture on the landscape. Continuous overland OHV use leads to destruction of vegetation, which in turn results in soil exposure, creating a contrast between the adjacent greens of natural vegetation and the browns and grays of exposed soil and organic materials. A contrast in line and form occurs when the irregular characteristics of vegetation is altered by a more regular line in the form of a developed route. Texture characteristics change from the natural course or rough textures of diverse vegetation to the smooth uniform texture of a developed route or mineral soil area.

Impacts from trail construction include changes in form, line, color, and texture on the landscape. Construction leads to destruction of vegetation, which in turn results in soil exposure, creating a contrast between the adjacent greens of natural vegetation and the browns and grays of exposed soil and organic materials. A contrast in line occurs when the irregular characteristics of vegetation is altered by a more regular line in the form of a developed route or constructed trail. Texture characteristics change from the natural course or rough textures of diverse vegetation to the smooth uniform texture of a developed trail with trail hardening techniques and mineral soil areas. Some changes to form may also occur with construction along hill sides and over ridges as the landform is cut to make the travel width.

Most routes or trails would attract attention of the casual observer if viewed from a higher observation point and if the routes or trails were located within the Foreground-Middleground and Background zones. Trails or routes that are properly designed and viewed from ground level, however, would not generally attract the attention of a casual observer except from trailhead observation points.

Impacts from road construction are similar from trail construction. Additionally, fugitive dust is also a visual impact resulting from construction activities and from the use of gravel or natural material roads. Fugitive dust is a short-term impact that can be temporary in nature and is dependent on the amount of traffic a road receives. Road construction and use would attract the attention of the casual observer if viewed from a higher observation point and located within the

Foreground-Middleground or Background zones. Roads that are properly designed and viewed from ground level, however, would not generally attract the attention of a casual observer, except as the road is being traversed. Where roads intersect, where the road is at a higher elevation than the viewpoint (traveling over a hill), or is viewed from an elevated location, it may attract the attention of a casual observer if viewed in the Foreground-Middleground and Background zones.

Impacts on visual resources from unrestricted aircraft landings include minor changes in primarily color and texture on the landscape. Repeated use results in soil exposure and creates a contrast between the adjacent greens of natural vegetation and the browns and grays of exposed soil and organic materials. The removal of rocks and debris that interfere with landing aircraft may create a contrast in texture characteristics from the natural course or rough textures of diverse vegetation to the smooth uniform texture of a cleared soil area.

Effects from Special Designations

The determination of suitable rivers for inclusion to the National WSR System would enhance visual resources in these areas by limited surface disturbance activities and managing for a natural landscape under WSR segments designated as “wild” and “scenic.” Management of existing designated Wild and Scenic rivers (Fortymile, Birch Creek, and Beaver Creek) maintains the visual resources within designated river segments.

Visual characteristics may be related to the criteria used to determine eligibility of a river for designation if one of the Outstandingly Remarkable Values is Scenic. The degree of naturalness and the presence of human-made alterations on the landscape of a river segment is also considered when determining the classification of a river segment. The classifications of “wild,” “scenic” and “recreational” reflect the naturalness of a landscape with “wild” being essentially primitive and undeveloped, “scenic” rivers are still largely primitive and undeveloped by may contain some development such as roads, trails and minor facilities. “Recreational” rivers are readily accessible and may have some development along their shorelines. Management decisions to preserve these characteristics help to preserve the visual resources of the area by limiting surface-disturbing activities and maintaining natural vegetation and landform on a scale of development from “wild” to “recreational.”

Effects from Hazardous Materials

Environmental remediation activities, such as the removal of surface or buried wastes from abandoned sites and removal of contaminated soils, would enhance visual resources by removing the surface or buried wastes, recontouring disturbed areas, and returning the site to blend with the existing landscape characteristics of line, form, color and texture. If viewed from an elevated viewpoint, these activities may attract the attention of a casual observer in the Foreground-Middleground and Background zones. Viewed from ground level, these activities may attract the attention of a casual observer in the Foreground-Middleground Zone.

4.3.1.9.2. Cumulative Effects

There are 33 communities (or areas) adjacent or located within the planning area that impact visual resources. These communities have set aside for possible development approximately 1,900,000 acres, some of which is adjacent to, but outside, the planning area. These developments introduce straight vertical lines, many different colors, and more smooth textures into an already disturbed landscape. Some changes to form also occurs as major surface disturbance activities

take place such as road building, bridges, and gravel pits. These community areas in total, comprise approximately six percent of the planning area.

Past, present and reasonably foreseeable actions that are relevant to visual resource management include mineral development, oil and gas development, increases in motorized use, utility and transportation rights-of-way, recreation use, and community development regardless of land ownership. All of these uses can have a direct or indirect impact to visual resources and scenic quality.

Past impacts have been limited to locations with mineral development potential, recreation development, isolated sites for communication or other leases, remote cabin and community developments, and some exploration activities for oil and gas development as well as transportation systems. Most of the planning area remains in a natural state. Development has been limited due to remoteness of the majority of the planning area.

Actions that enhance wildlife and fisheries habitats, protect sensitive vegetative communities, and protect water resources, and special designations such as Areas of Critical Environmental Concern and Wild and Scenic Rivers, will also help protect visual resources by limiting development or applying restrictions to development and indirectly protect the naturalness of the area.

Present and future impacts will continue to occur on the non-BLM lands, as these are developed for resource uses such as oil and gas, minerals, forestry, and renewable energy. Rights-of ways to these developments may impact both BLM and non-BLM lands. Community expansion and remote parcel development is expected to continue, increasing the need for communication sites and other leases. Transportation needs will continue to grow as populations increase and shift locations. Only twenty-two percent of the land base in the planning area is managed by the BLM.

Climate change may have an impact on visual resources through changes to vegetative composition as deciduous trees become increasingly dominate on the landscape and frequency and intensity of wildland fire increases. Melting permafrost may cause changes to waterbodies and landforms by causing lakes to merge, or become smaller due to draining, and cliff formations slough along rivers, streams and lakes. Overall streams and rivers may have higher banks and more gravel bars as water levels drop as the planning area becomes warmer and drier over the next century. All these changes will appear natural due to the slow nature of climate change.

Land owner	VISUAL RESOURCE INVENTORY (VRI) CLASSES									
	VRI Class I		VRI Class II		VRI Class III		VRI Class IV		Totals	
	acres	%	acres	%	acres	%	acres	%	acres	%
Fortymile Subunit										
BLM	145,000	8	1,870,000	90	6,000	0	48,000	2	2,069,000	13
Non-BLM	0	0	11,040,000	80	735,000	5	2,005,000	5	13,781,000	87
Steese Subunit										
BLM	69,000	5	1,136,000	89	25,000	2	45,000	4	1,275,000	30
Non-BLM	0	0	827,000	28	1,000	0	2,097,000	71	2,925,000	70
Upper Black River Subunit										
BLM	0	0	1,478,000	63	448,000	2	435,000	18	2,361,000	30
Non-BLM	0	0	1,406,000	26	814,000	15	3,177,000	59	5,397,000	70
White Mountains Subunit										
BLM	70,000	7	950,000	93	0	0%	0	0	1,020,000	32
Non-BLM	7,000 ^a	0	840,000	40	69,000	3	1,212,000	57	2,126,000	68

^aBeaver Creek WSR Corridor managed by the USFWS with a Class I VRI special designation.

4.3.1.10. Wilderness Characteristics

Summary of Effects

Short-term and long-term effects to naturalness could occur from surface-disturbing activities associated with management of resources, mining activity, or land use authorizations. Increased access due to BLM-authorized activities may decrease opportunities for solitude while increasing opportunities for primitive, unconfined recreation. Visual resource management would generally help maintain naturalness. Recreation prescriptions would generally help maintain naturalness in areas where wilderness characteristics would be maintained. In other areas, recreation and travel management decisions may impact naturalness and opportunities for solitude. Effects on wilderness characteristics would be the lowest under Alternative B, somewhat higher under Alternative C, and the greatest under Alternative D.

4.3.1.10.1. Effects Common to All Subunits and Action Alternatives

There would be no effects to wilderness characteristics in any of the subunits, in any of the alternatives, from the following programs, resources, or resource uses and they will not be analyzed further: Air and Atmospheric Values, Cave and Karst Resources, Fish and Aquatic Species, Hazardous Materials, Non-Native Invasive Species, Soil Resources, Special Status Species, Subsistence, Vegetative Resources, Water Resources, and Wildlife.

Effects from Cultural and Paleontological Resources

The discovery of cultural or paleontological resources could result in field research projects. These activities could create temporary surface-disturbing activities through digging and excavation. If these activities are conducted in an area with wilderness characteristics, a short-term loss of naturalness and solitude could occur in the immediate areas of research due to excavation activities. In the long-term, however, no impacts to wilderness characteristics are expected.

Effects from Wildland Fire and Ecology Management

Both wildland and prescribed fire could affect the wilderness characteristics of naturalness and solitude. Fire management activities (such as firefighters, aircraft support, and vehicles) could have short-term impacts to the wilderness characteristics of an area. Opportunities for solitude would be diminished during times of fire management actions. Naturalness would be impacted for as long as evidence of fire suppression actions, such as firelines or evidence of vehicle use, remains on the land.

Effects from Forest and Woodland Products

Commercial timber harvest would generally not occur in areas where wilderness characteristics are being maintained. Impacts to wilderness characteristics could occur from firewood harvest and disposal of forest products. Harvest activities could impact naturalness and solitude over the short-term. The removal of vegetation would diminish naturalness until revegetation occurs. Additional impacts to wilderness characteristics could occur from activities associated with forest product removal, including cross-country vehicular travel, and temporary camps.

Effects from Lands and Realty

The BLM would not dispose of any lands whose wilderness characteristics are being maintained. However, for lands whose wilderness characteristics are not being maintained, disposal of those lands could result in the loss of naturalness and opportunities for solitude and primitive recreation if the new owner chooses to develop the parcel. Sale of scattered parcels of BLM lands would have minimal effect as these lands are generally too small to have wilderness characteristics, are surrounded by state or private lands, and are not adjacent to BLM lands where wilderness characteristics are to be maintained.

Exchange of BLM parcels with state or Native lands for the purposes of consolidating land ownership could impact wilderness characteristics if the exchanged lands were developed after leaving BLM management. Exchange could also benefit wilderness characteristics if the BLM acquired lands immediately adjacent to lands where wilderness characteristics were being maintained. Exchanges could result in the remaining lands no longer being of sufficient size to make it practicable to preserve wilderness characteristics. Conversely, exchanges may also increase the size of BLM land holdings in any given area, resulting in new areas that would be of sufficient size to make maintaining wilderness characteristics practicable.

Land use authorizations resulting in development of roads, renewable energy, or other types of facilities would diminish naturalness within the viewshed of the facility. If the authorization resulted in additional access, opportunities for solitude could decrease. Land use authorizations, however, would be considered in the context of applicable land use decisions. For example, on lands being managed for a Semi-Primitive recreational setting, land use authorizations would have to be consistent with that setting and thus would be unlikely to adversely affect wilderness characteristics.

Effects from Minerals

Where lands managed to maintain wilderness characteristics overlap with mineral withdrawals enacted by ANILCA, the only effect would be from activity on valid existing mining claims. If these claims were developed the naturalness would be impacted within the viewshed of the development until the site was reclaimed to the extent that it appeared natural looking. Opportunities for solitude would be reduced during the life of the mining activity. Effects on valid existing claims would be limited to the Fortymile and Steese subunits. Similar impacts could occur in the Upper Black River subunit in areas this plan recommends to be opened to mineral entry. Due to the low mineral potential and lack of access to these areas, however, no placer mining is anticipated.

In areas where wilderness characteristics exist, but would not be maintained by other decisions in this plan, impacts to naturalness and solitude could occur from mineral decisions. The RMP would open fifteen to seventy-five percent of the planning area to new mineral entry. In these areas, naturalness and opportunities for solitude would be reduced if mining claims are staked and exploration or development occurs. However, the low mineral potential and lack of access to many of the BLM lands would reduce the potential for any mining-related activity to occur. Additionally, mining claims typically affect a relatively small area, since claimants must pay an annual assessment fee. Wilderness characteristics would be unaffected if no activity occurred. For example, the Upper Black River Subunit has low mineral potential and no overland access. Although one alternative in this RMP would open all of the subunit to new mineral entry, no mining activity is anticipated. Even if mining claims were staked, they would be unlikely to involve more than a few thousand acres out of the 2.3 million-acre subunit. Wilderness characteristics would likely be unaffected on the vast majority of the subunit.

Effects from Recreation and Travel Management

Generally, lands where wilderness characteristics would be maintained are located within Recreation Management Zones that contain either Primitive, Semi-Primitive, or Backcountry Recreation Opportunity Spectrum Setting Prescriptions. These prescriptions guide recreation uses that are consistent with the maintenance of wilderness characteristics. In areas where wilderness characteristics exist, but would not be maintained, impacts to naturalness and solitude could occur from recreation and travel management decisions (e.g., construction of new motorized trails, campgrounds, or other facilities).

Effects from Visual Resources

Visual Resource Management Classes are generally assigned based on the suite of management decisions in the RMP for a given parcel of land. For example, lands managed for a Semi-Primitive recreational setting are assigned a VRM Class consistent with maintaining that setting. VRM allows the BLM to protect visual resources while allowing other activities to occur.

Lands where wilderness characteristics would be maintained would be managed as VRM Class I or Class II which is consistent with maintenance of wilderness characteristics because low levels of development generally occur and facilities would be constructed to blend with the surrounding landscape. A VRM Class I or II designation would help maintain naturalness.

VRM Class III prescriptions could be consistent with the maintenance of wilderness characteristics if the overall level of development was kept to a moderate level, and if developments were designed not to impact the naturalness of the area and to blend with the surrounding landscape. VRM Class IV prescriptions would generally not be consistent with maintaining wilderness characteristics because the overall level of development would conflict with maintaining wilderness characteristics. In VRM Class IV areas, impacts to naturalness may occur.

4.3.1.10.2. Alternative A

Under this alternative, areas with wilderness characteristics are not identified.

4.3.1.10.3. Alternative B

Under Alternative B wilderness characteristics would be maintained on 5,059,000 acres in the Fortymile, Steese, Upper Black River, and White Mountains subunits. Effects would be the same as those discussed under section 4.3.1.10.1 Effects Common to All Subunits and Action Alternatives.

4.3.1.10.4. Alternative C

Under Alternative C wilderness characteristics would be maintained on 2,067,000 acres in the Fortymile, Steese, and White Mountains subunits. Effects are described under section 4.3.1.10.1 Effects Common to All Subunits and Action Alternatives.

4.3.1.10.5. Alternative D

Under Alternative D wilderness characteristics would be maintained on 742,000 acres in the Fortymile, Steese, and White Mountains subunits. Effects are described under section 4.3.1.10.1, Effects Common to All Subunits and Action Alternatives.

4.3.1.10.6. Cumulative Effects

Cumulatively, the impacts to wilderness characteristics in the planning area are expected to be very minimal. In addition to those lands where the BLM would maintain the wilderness characteristics, in areas where the BLM would not maintain the wilderness characteristics, those characteristics may remain intact, since incompatible activities (such as mineral development, and roads) are expected to be very minimal. In all likelihood, wilderness characteristics would remain on most of BLM-managed lands for the life of the plan.

Wilderness characteristics would be maintained on 742,000 to 5,059,000 acres of BLM-managed lands, in addition to 11.2 million acres managed in a similar fashion by the National Park Service and U.S. Fish and Wildlife Service. Approximately 1.8 million acres (eighty-five percent of the preserve acreage) in the Yukon-Charley Rivers National Preserve is suitable for wilderness designation (NPS 1983). In 1987, the USFWS identified 650,000 acres in the White and Crazy Mountains, within the Yukon Flats NWR, as meeting the criteria for wilderness designation (USFWS 1987). The USFWS Minimal Management category, which applies to 9.4 million acres in the planning area, would be consistent with maintaining wilderness characteristics. When considering lands managed by other federal agencies, the amount of lands where wilderness characteristics would be maintained within the planning area, would increase from about 11.2 million acres to 16.2 million acres under Alternative B. Alternatives C and D would add 2,067,000 and 742,000 acres respectively.

4.3.1.11. Wildland Fire Ecology and Management

Summary of Effects

The effects of other resources or uses on wildland fire are minimal or nonexistent. One exception is if wildland fire is excluded from an area to protect other resources or uses.

4.3.1.11.1. Effects Common to All Alternatives

The following resources, resources uses, or programs would either have no effect or have negligible effects and are not analyzed further: Air, Cave and Karst, Cultural and Paleontological Resources, Fish and Aquatic Species, Non-Native Invasive Species, Soil Resources, Special Status Species, Vegetative Communities, Visual Resources, Water Resources, Wilderness Characteristics, Wildlife, Forest and Woodland Products, Land and Realty, Minerals Management, Recreation, Renewable Energy, Travel Management, Special Designations, Subsistence, and Hazardous Materials.

Effects from Wildland Fire

The biggest potential impact to Fire Management is in areas where wildland fire exclusion is being attempted. Long-term wildland fire suppression in the boreal forest does not create a fuel loading problem in the classic sense. Although the overall fuel load on any particular site may

increase with time and fire exclusion, it usually does so with additional biomass being added to the organic layer. It also creates large homogeneous stands of flammable fuels, usually black spruce. Species diversity is decreased. The end result is larger, more severe wildland fires that may be outside the range of natural variability. This attempt at wildland fire exclusion then impacts other resources over the long-term and with potentially high impact effects. For example, attempts at fire exclusion in the Fortymile caribou herd wintering range could result in significant portions of their range burning in one fire event, limiting the carrying capacity of their range.

Areas that are in the Critical, Full, or Modified fire management options have the potential to lose key ecosystem components due to fire exclusion and move from Fire Regime Condition Class 1 to Condition Class 2 or 3. Based on desired conditions for land use and resources objectives, these conditions may be mitigated through fuel management projects or a change in fire management option. If the areas were not treated fire size and severity would increase, life and property could be lost, and resources could be adversely impacted. These areas need to be monitored closely for adverse impacts.

4.3.1.11.2. Cumulative Effects

Wildland fire management decisions cross agency and administrative boundaries. There are several areas along the Alaska Highway and in the Central-Circle area that are in the Full and Critical fire management options and are adjacent to BLM lands. These areas would have impacts associated with fire exclusion, including changes in the Fire Regime Condition Class and vegetation.

The BLM commissioned University of Alaska Fairbanks to identify vegetation and fire regime response to projected future climate change (Rupp and Springsteen 2009b). The report predicts a general increase in fire activity through the end of this century in response to projected warming temperatures and less available moisture, and suggests that boreal forest vegetation would change from a spruce dominated landscape to a deciduous-dominated landscape. The most rapid changes in wildland fire activity and associated changes in vegetation would occur in the next 30 to 40 years. In spite of the shift in vegetation towards less flammable younger age stands and deciduous species, there would be more frequent wildland fires; resulting in an overall increase in area burned annually.

4.3.1.12. Wildlife

Summary of Effects

Only Cave and Karst Resources and Cultural and Paleontological Resources have no anticipated impacts to wildlife. Management to maintain several other resources will generally benefit wildlife, including Soil and Water Resources, Special Status Species, Vegetative Communities, Visual Resources, Wilderness Characteristics, and Subsistence. Management of Non-Native Invasive Plants and cleanup of Hazardous materials and Abandoned Mine Lands will generally benefit wildlife habitats. In general, a natural fire regime is considered beneficial to wildlife and is maintained over most of the planning area by the "Limited" Management Option designation in fire plans. The effects of several resource uses are expected to be small due to little activity predicted; they are discussed below, including Forest and Woodland Products, Solid Leasable Minerals, Salable Minerals, and Renewable Energy.

A variety of actions can occur in the Lands and Realty program, such as permits for uses of BLM lands. They will generally be generated from outside the BLM, guided by ROPs and leasing stipulations, and the impacts analyzed on a basis. Wildlife management decisions are designed to benefit wildlife resources, including one ROP which does not allow use of domestic sheep, goats, or llamas as pack animals by BLM-permittees (such as commercial outfitters) and thus reduces the potential for disease transmission to Dall sheep. Members of the public could use these pack animals, however, (except in Alternative B), and potential impacts to Dall sheep are considerable.

The types of impacts which can occur from Recreation, Travel Management, and Locatable and Fluid Leasable Minerals are discussed in detail below. In addition, there are unit-specific discussions of the effects of these resource uses in individual subunit discussions. Negative effects on wildlife are greatest in Alternative D and least (among action alternatives) in Alternative B. In some subunits, Alternative B opens areas to mineral location, entry, and leasing which will result in greater impacts to wildlife relative to the No Action Alternative.

Cumulative effects could occur from a variety of activities on state and private lands as well as from climate change. Cumulative impacts are very uncertain, but impacts to caribou could potentially be considerable in some alternatives.

4.3.1.12.1. Effects Common to All Alternatives

Proposed management of the following resources/resource uses/programs would have no anticipated impacts to wildlife management and will not be analyzed further: Cave and Karst Resources, and Cultural and Paleontological Resources.

Effects from Air and Atmospheric Values

If lightning-ignited wildland fires are suppressed to minimize smoke effects on public health, recreation, communities, or tourism, a deviation from the natural fire regime may occur, with resultant effects on wildlife habitats (described below under Effects from Wildland Fire Ecology and Management).

Effects from Fish and Aquatic Species

Riparian areas are high-quality habitats for many species of wildlife and may be crucial for some. For example, many migratory bird species achieve greatest abundance in riparian habitats. A variety of species are very dependent on stream and riparian habitats, including river otter, beaver, mink, water shrew, muskrat, waterfowl and shorebirds. In addition, there is energy exchange between aquatic and upland habitats. Aquatic habitats often increase productivity of adjacent upland habitats, for example, through re-distribution of the energy contained in spawning salmon to adjacent areas by predators and scavengers. Most BLM-Alaska sensitive species animals rely on riparian or wetland habitats. Most Bird Species of Conservation Concern are also dependent or most abundant in riparian/wetland habitats.

All alternatives contain measures to minimize impacts to fish and aquatic habitat. Those alternatives that are most successful in doing so will be most beneficial to wildlife species, with the primary determinant of impacts being the amount of area open to locatable minerals. Some Riparian Conservation Areas (RCAs) and High Priority Restoration Watersheds are closed to locatable minerals; where open, RCA management will improve reclamation success and reduce impacts to riparian vegetation. For all action alternatives, Desired Habitat Conditions are identified and ROPs will be implemented to meet Desired Habitat Conditions (section 2.4.1.3

Fish and Aquatic Species; Appendix A, *Required Operating Procedures and Fluid Mineral Leasing Stipulations*).

Effects from Non-Native Invasive Species

Non-native invasive plant species (NIP) have had large effects on wildlife species outside of Alaska through alteration of habitat, and this indicates the potential for impacts within Alaska. Introduction and spread of non-native animal species is also a potential impact. All action alternatives will include attempts to monitor and control the spread of invasive species. Requirements to use certified weed-free sources of seed, feed and mulch, and gravel will reduce potential for introduction of NIP from some activities. These measures will reduce impacts, but some increased abundance of NIP and loss of habitat for native wildlife species can be expected. Roads and trails (and associated vehicle use) are recognized as the primary avenues of NIP species spread. Alternatives which minimize creation of roads and trails and off-trail use of summer OHVs will reduce potential spread and impacts of NIP. Treatment of NIP infestations may impact wildlife habitats, but generally less than continuation and spread of NIP at the site.

Effects from Soil Resources

Soil is the basic foundation of wildlife habitat in the planning area. Impacts to soils result in impacts or changes to vegetation which in turn result in impacts or changes to wildlife populations. Measures which limit impacts to soils would also limit impacts to wildlife habitats. All action alternatives contain measures to limit impacts to soil.

Effects from Special Status Species

Generally, provisions to conserve Special Status Species plants and animals would benefit other wildlife as well. Such measures would be applied under all action alternatives.

Effects from Vegetative Communities

Generally, provisions related to vegetative communities are designed to maintain natural biodiversity and will benefit wildlife habitats. All alternatives contain some provisions to protect vegetation. Alternatives B, C, and D have ROPs (Appendix A, *Required Operating Procedures and Fluid Mineral Leasing Stipulations*) that provide more protection than in Alternative A. However, allowed uses in some alternatives may increase residual and cumulative impacts beyond current levels.

Effects from Visual Resources

To the extent that VRM classes result in changes in construction that simply shield or camouflage facilities from view, they will have little effect on wildlife. If VRM classes result in limitations to levels of surface disturbance, wildlife resources will benefit from reduced habitat disturbance and indirectly by reduced levels of human activity. Lower numbered VRM classes may be an indicator of management beneficial to wildlife.

Effects from Water Resources

Maintenance of water quality and natural hydrologic functions will benefit wildlife. All alternatives provide measures to protect water quality.

Effects from Wilderness Characteristics

Management for maintenance of wilderness characteristics (such as maintaining naturalness and opportunities for solitude) will generally benefit wildlife by minimizing disturbance of habitats and minimizing levels of human use to low to moderate levels. In the various alternatives, the number of acres managed for maintenance of wilderness characteristics can be an indicator of management beneficial to wildlife.

Effects from Wildland Fire Ecology and Management

These effects are described in detail in the Land Use Plan Amendment for Wildland Fire and Fuels Management for Alaska (BLM 2004b, 2005c). Short-term negative impacts from wildland fire on resident wildlife include displacement, disruption of reproductive activities, and occasional mortalities of animals with low mobility. Populations of certain species can recover quickly, however, if suitable habitat is available. Adverse effects to individuals are generally offset by the benefits of habitat changes for future generations. Wildland fire helps maintain a mixture of vegetation types and age classes that provide habitat for a variety of wildlife. Fire alters habitats and may improve habitat components for some species while degrading habitat for others. Over time, as vegetation recovers from fire disturbance, various species of wildlife would benefit from various successional stages of vegetation. Herbivores are directly affected by the changes in vegetative cover and forage associated with fire, where predators respond to both changes in cover and abundance of prey. Wildlife in Interior Alaska has evolved in the presence of wildland fire and are generally adapted to it.

Overall, a natural fire regime has a beneficial effect on maintaining a diversity of wildlife and their habitats. Early seral stage communities are generally more productive than late seral communities. Grasses, sedges and herbaceous plants that quickly resprout after fire provide forage and cover for small mammals, grassland birds, and grazing species such as caribou. Browsers such as moose, hares, and ptarmigan benefit from fire when trees and shrubs begin to reestablish themselves. If fires are not too severe, sprouting of shrubs will occur soon after burning. Severe wildland fires which consume most of the organic matter are more likely to result in a change from conifer to deciduous dominance of a site. Moose generally benefit from fire due to increased production of high quality browse for 10 to 30 years after fire (McCracken and Viereck 1990, Maier et al., 2005), although population-level changes may depend on predation pressure. Prescribed fires are a management tool which may be used to improve moose habitat.

The short-term effects of fire on caribou winter range are negative, and vary depending upon the severity of the burn. Lichens, primary winter forage for caribou, are highly susceptible to wildfire. Impacts to habitat include reduced availability of forage lichens for up to 80 years after fire (Klein 1982, Joly et al., 2003, Collins et al., 2011). On caribou summer ranges, forage quality of vascular plants is improved by fire. Fire also affects caribou movement patterns. Caribou actively avoid burned areas for 35 to 50 years after a fire (Joly et al., 2003). It is speculated that, over the long-term, wildland fire would likely be beneficial to caribou as it helps maintain the ecological diversity of the habitat and may prevent mosses from out-competing forage lichens. Few forest stands, however, may reach an advanced age at which moss replaces lichens (Collins et al., 2011). Periodic wildland fires create a mosaic of fuel types and fire conditions that naturally precludes large, extensive fires (BLM 2004b).

Wildland fire is rare in alpine and subalpine habitats used by Dall sheep. Fire may enhance sheep habitat by reducing encroachment of shrubs and spruce into alpine and subalpine habitats or temporarily eliminating forest cover near lower-elevation rocky habitats. Fire can also increase

the amount or quality of herbaceous and graminoid forage available and reduce cover used by bears and wolves when hunting sheep.

Wildland fire has both beneficial and negative effects on bears. Beneficial effects include increasing the availability of forage plants such as berries, grasses and forbs; although some forage species may be reduced or temporarily eliminated by fire. Moose calves are an important prey item for both black and grizzly bears. Early stages of plant succession due to fire tend to increase moose production, resulting in more calves available for prey (BLM 2004b). Large burns may be avoided by bears within two or more years of the fire.

The effects of wildland fire on furbearers are variable depending on the species. Carnivorous furbearers (e.g., lynx) respond to fire in a manner similar to their prey species, though there tends to be a lag period. If prey species benefit from fire, predators do as well. Snowshoe hares, voles, and other small mammals tend to respond positively to vigorous re-growth triggered by wildland fires. Populations of species such as marten and lynx tend to increase as well, tracking those of prey species (Johnson et al., 1990). Herbivorous furbearers tend to benefit from fire due to rejuvenation of forage plants. Beavers may be negatively affected by severe fires in localized areas until forage species recolonize the area, but generally willow and deciduous tree re-growth following fires will benefit beaver.

It is difficult to generalize impacts of wildland fire on passerine birds due to the great variety of habitat requirements. Shrub communities often support the greatest number and diversity of passerine birds (Spindler and Kessel 1980, Kessel 1989). Many shrub communities are maintained or recreated by periodic fires. Within forested areas, wildland fire creates openings in the forest and snags used for nesting, perching, and foraging. Wildland fire may cause direct impacts to birds when it occurs during the nesting season, killing nestlings and destroying nests. Raptors may benefit from fire due to increased populations of small mammals and birds in response to vegetative changes after wildland fire. The timing of the benefit varies depending upon the type of prey favored by the raptor. Over the short-term, fires reduce cover available for prey species, making them more visible to raptors.

Wildland fire suppression activities also cause both direct and indirect impacts to wildlife. Wildlife habitat may be destroyed, fragmented, or degraded due to construction of fire breaks or use of OHVs. Firelines not rehabilitated in a way which prevents use by OHVs may result in unplanned OHV trails and associated use. Degradation of firelines by thermokarst or erosion may prevent vegetation re-establishment. ROPs are designed to reduce the impacts of suppression activities include limitations on the use of tracked or off-road vehicles; measures to prevent the introduction of non-native invasive plant species; limiting construction of firelines (dug to mineral soil) in riparian zones; and rehabilitation of fire and dozer lines (Appendix A, *Required Operating Procedures and Fluid Mineral Leasing Stipulations*). Impacts from wildland fire suppression would be infrequent because most BLM-managed lands are currently distant from the road system and in the "Limited" management option, which will minimize the use of mechanized equipment. Lands closer to the road system will receive more fire suppression activity and greater effects.

Most BLM lands in the planning area are within the "Limited" management option and a near-natural fire regime will result. However, areas near the road system and communities are typically within modified, full, or critical management options and fire suppression will artificially modify the fire regime in these lands with associated impacts to wildlife habitats.

Effects from Wildlife

Most wildlife decisions in the action alternatives of this RMP are common to all subunits. Exceptions include the ACECs designated to protect wildlife habitat values and ROPs specific to those ACECs. The decisions set desired future conditions (stated in the forms of goals) and establish Required Operating Procedures for activities which may be authorized by the BLM.

Planning area-wide ROPs limit impacts by: specifying that pipelines and roads allow free movements of wildlife; limiting vegetation removal to nesting migratory birds; designing powerlines and other structures to minimize danger to and use by raptors and other birds; limiting use of domestic sheep, goats and llamas in Dall sheep habitat to minimize disease transmission; limiting activities in Dall sheep and caribou habitat during lambing and calving/postcalving; avoiding attraction of wildlife to food and garbage; and limiting activities allowed near nests of priority raptors. Although not part of Alternative A (no action), some of these measures are being implemented currently as stipulations in land use permits.

Many decisions will continue to rely on analyses of plans and activities (during project planning and through the NEPA process) to reduce impacts to wildlife. Avoidance of important wildlife habitat and enactment of mitigation measures may be accomplished during project planning, analysis, and implementation.

Dall Sheep Health

Wild sheep populations in the U.S. and Canada have been shown to be susceptible to diseases of domestic livestock, and a large body of knowledge has accumulated to indicate that interaction of domestic sheep and goats with wild sheep can lead to major die-offs, as well as more subtle impacts such as reductions in lamb production and survival. (Schommer and Woolever 2008). Allowing the use of domestic goats in and near Dall sheep habitats could result in substantial risks to health and productivity of Dall sheep populations through disease transmission. Allowance of llama/camelid use is currently considered a smaller risk (WAFWA 2007).

Although grazing permits will not be issued in the planning area in any action alternative, domestic livestock might be used as pack animals or for weed control. Horses, llamas, and domestic goats are sometimes used as pack animals. Horses are considered to represent little disease transmission risk to Dall sheep, llamas are an uncertain but an increased risk, and domestic goats a larger risk. A few llamas have been used, but use of pack goats is currently not known to occur in the planning area. Use of pack goats may be increasing within the state. Risks from use of pack goats and llamas are not easily quantified, but are recognized to be real, with very large consequences (Garde et al., 2005). Risks of transmission from closely tended animals (as is typical with pack animals) are lower than with herds of free-ranging animals, but still significant. Some animals may escape or be lost and could associate directly with Dall sheep.

Pack goat use in bighorn sheep habitat has been prohibited in several National Forest and National Park units in the western U.S. to reduce risk of disease transmission to wild sheep. Garde et al., (2005) examined disease risks in the Northwest Territories (NWT) and concluded that "...given the naïve state of both Dall's sheep and mountain goats, we suspect that any contact between these species and domestic sheep, goats and llamas could result in disease with serious outcomes for populations of these valuable game animals." Their recommendations include this statement: "Our Risk Assessment indicates that contact between domestic sheep or goats and wild Dall's sheep or mountain goats would likely result in significant disease in the wild species with substantial negative and long-term effects on population dynamics and sustainability. We strongly advise that domestic goats not be used as pack animals, and that domestic sheep and goats not be pastured anywhere in the vicinity of Dall's sheep or mountain goat ranges within the NWT." Similarly, the

Wild Sheep Working Group of the Western Association of Fish and Wildlife Agencies (WAFWA 2007) recommended the following: “Additional precautions should be taken to ensure that absolutely no contact occurs between naïve thinhorn sheep and domestic sheep and goats.”

Effects from Forest and Woodland Products

The effects of Forest and Woodland Products to wildlife habitats are largely described in the Vegetative Communities section 4.3.1.8. In addition to effects on vegetation, timber harvest can result in loss of snag trees for cavity nesting birds, direct mortality of small animals or nesting birds, disturbance/displacement of wildlife in the vicinity of the operation and along roads or trails to the site. Of these impacts, roads are often considered the biggest impacts to wildlife from forestry. Impacts of roads and trails are discussed below under “Effects from Locatable Minerals.”

Effects from Lands and Realty

Wildlife habitats on lands identified for disposal could be transferred to other ownership which may result in impacts. Acquisitions could benefit wildlife. Permits for uses of BLM lands may involve uses and activities which will impact wildlife habitats, but those activities will generally be guided by ROPs and leasing stipulations (Appendix A, *Required Operating Procedures and Fluid Mineral Leasing Stipulations*) and the remaining effects will be analyzed and may be mitigated in the permitting process. There are no right-of-way exclusion areas in the planning area. Rights-of-way could have impacts similar to those discussed under “Effects from Locatable Minerals” and could contribute to fragmentation of wildlife habitats.

Effects from Fluid Leasable Minerals

Leasing of minerals is not anticipated during the life of the plan. Should leasing be proposed, it will be analyzed in a separate NEPA document. Seismic exploration for oil and gas will be allowed in portions of all subunits in at least some alternatives and could have direct impacts on wildlife, including temporary disturbance.

Direct loss of habitat occurs with clearing of seismic lines. Vegetation in seismic lines has been shown to be quite slow to recover (USFWS 2008a). Lines may be used by summer and winter OHVs, which can exacerbate impacts and slow or prevent recovery. Continued vehicle use of the lines may result in longer-term displacement of wildlife such as caribou.

Seismic activities may affect denning bears if it occurs in close proximity (Reynolds et al., 1986, as cited in USFWS 2008a). Some bears will abandon dens in response to activity within one km of the den, especially within 200 m or early in the denning period (Linnell et al., 2000).

In one study of the effects of pipeline ROWs on marten, Marklevitz (2003, as cited in USFWS 2008a) found no adverse effects of the ROWs (50 to 300 feet wide) on density of marten populations, but some apparent reluctance by marten to cross the larger ROWs. The expected 14-foot width of most seismic lines would be expected to cause little impact to marten.

Caribou would be expected to be temporarily displaced from winter seismic survey activities and/or increase movements (Bradshaw et al., 1997). As long as large areas were not undergoing seismic survey activities in the same period, caribou could likely adjust range use to avoid activities, possibly returning later. However, long-term avoidance of inactive seismic lines by caribou has been demonstrated (Dyer et al., 2001), possibly related to wolf use of the lines (James and Stuart-Smith 2000).

In general, large and medium mammal responses to seismic activities are expected to be temporary avoidance of the local area. Small rodents such as voles could suffer direct mortality, but this would be insignificant to populations in the area. Most birds are absent during the period of the year of seismic exploration (December-April), but resident species could be temporarily displaced and some early-nesters (such as owls) may have their nests destroyed.

A total of 20 miles of seismic line is anticipated to be constructed on BLM lands within the life of the plan, most likely in the Steese or Upper Black River subunits. Impact of this amount of activity would most likely be local in nature.

Effects from Solid Leasable Minerals

Leasing of coal would not occur without additional NEPA analysis and a land use plan amendment, although exploration activities could occur on any place open to leasing. Coal inventory and exploration could also be approved in areas closed to leasing. Considerable surface disturbance may occur with exploration for coal. Exploration for coal, if any, is anticipated to occur only in the Eagle Field (in the northern Fortymile Subunit). No leasing or exploration of other solid minerals is anticipated due to lack of known occurrence of economic quantities in the planning area. In the unlikely event that leasing of other solid minerals would occur, impacts to wildlife could be similar to that of large lode mines (See Effects from Locatable Minerals below).

Effects from Locatable Minerals

Locatable mineral extraction operations expected to occur on BLM lands in the planning area include small- and large-scale placer mines and suction dredging. Pre-feasibility exploration for large-scale lode mining is expected, but no mines are predicted to be developed on BLM lands during the life of the plan. Impacts include direct loss of habitat from the operations and access routes, wildlife disturbance associated with the operations resulting in some level of avoidance, and changes in human use of the area from changes in access.

Suction dredging, though not directly impacting riparian zones, may impact riparian vegetation through long-term camping activities, and may disturb or displace wildlife in the immediate vicinity of the operation. Nesting raptor species may be impacted by suction dredging activities occurring near nest sites, potentially through nest abandonment or reduced chick survival.

Placer mines typically disturb riparian and near-stream vegetation and the stream channel, which may also result in downstream effects on riparian vegetation and aquatic habitat. Riparian habitats are typically very high-value habitats for wildlife and provide essential habitat for some species. Many species are found in much higher densities in riparian habitats and riparian habitats may be important habitats within their home ranges, including moose and many migratory birds. Peregrine falcons and other raptors also commonly nest along streams.

Recovery of habitats from placer mining is highly variable and may be very slow. It may require 50 years or more (following initiation of reclamation) in some areas for riparian area habitat quality to approach pre-mining conditions. Some mine sites remain in operation for many years, with a portion of the mine area disturbed for the duration of mining. Reclamation often does not proceed as planned due to changing of operators, or financial or logistical difficulties. Placer mining brings a change in habitat, typically from late seral to early seral community types. The potential exists, given proper revegetation, that some wildlife species (such as moose) may benefit from the early seral vegetation communities created at revegetated mine sites.

The number of placer mining operations on BLM lands in the planning area is predicted to range from 42 to 67 small mines and from six to eight large mines during the life of the plan (dependent on alternative). Actual numbers could be considerably higher, but will likely result in disturbance of small proportions of BLM lands in the planning area (less than one percent). (The area of riparian area disturbed by placer mining on BLM lands in the planning area is unknown.) However, placer operations concentrate impact on relatively uncommon stream riparian and aquatic habitats, which are generally high-value wildlife habitats, and effects will persist beyond the life of this plan. In addition, the access to mine sites can cause surface disturbance and indirect impacts to many more acres than the mines themselves. Roads and trails for mining access often occur in or near riparian areas and involve multiple stream crossings.

Depending on availability of existing access to a mine site, road and trail construction and use may create greater surface disturbance and impacts to wildlife than mines themselves (see also Vegetative Communities) and roads and trails may be utilized for purposes other than mining. Roads facilitate access by summer and winter OHVs to surrounding area which may previously have been remote and inaccessible. Increased access can result in increased human garbage available to bears, ravens, foxes, and other scavengers, potentially leading to either increased populations of predators or destruction to protect life or property. The human activities associated with mining roads, trails, and other infrastructure can potentially result in displacement of wildlife species and result in loss of habitat effectiveness. For example, Powell (2004) noted that snowmobilers utilized a network of old mining roads to access the majority of the Ibex caribou herd's winter range.

Impacts from roads can often be mitigated by such measures as restricting access to mine site workers only, prohibiting hunting and off-trail use of OHVs by workers, building the road in a manner which facilitates reclamation, and promptly closing and reclaiming the road following use. However, roads typically become open for public use and are not often closed or reclaimed.

Exploration activities in areas opened to mineral location and entry may involve significant helicopter activity which can affect many wildlife species, but most notably caribou, sheep, and nesting raptors and trumpeter swans. ROPs will limit, but probably not eliminate, low-level aircraft activities during lambing and calving/postcalving seasons in seasonal caribou and sheep habitat (Appendix A, *Required Operating Procedures and Fluid Mineral Leasing Stipulations*). Impacts may also occur to these species in other seasons or outside of identified calving and lambing habitats, and may also affect other species depending on location, altitude, and intensity of flights. Reconnaissance exploration, in which a field camp(s) may be established and daily helicopter flights transport geologists to sampling sites, will likely occur initially. Drilling exploration may occur subsequently in areas of interest. Helicopter supported exploration drilling can involve substantial helicopter activity (an estimated eight hours flight time per drill move) and will be more concentrated in a specific location. If the site is close enough to a road system to make road-building economical, roads will be built to each drill site, which will involve substantially more surface disturbance. Placer exploration may involve trenching and drilling, but would not normally impact the stream channel. Roads and trails may be built to access exploration sites, if feasible. As mining companies do not necessarily share exploration data, multiple exploration operations could occur in the same area, extending impacts over multiple years or intensifying impacts within a year.

Potential effects of mining road and facility development on caribou:

Despite a large body of evidence that caribou have a negative response to human disturbances (Johnson et al., 2005), the effects of roads and industrial development in caribou habitat are not clearly established. Many studies have demonstrated an avoidance of areas near roads and infrastructure, with most regional-scale studies indicating caribou and reindeer reduce their use of areas within one to 10 kms of development (Boulanger et al., 2012, Vistnes and Nellemann 2008). Wasser et al., (2011) detected reduced use by caribou of areas within 13 kms of winter oil exploration roads, and measured higher stress hormones in caribou that did use areas near these roads. Cameron et al., (2005) found that calving caribou avoided areas within four km of roads (ie., used them less than expected based on availability) in the Kuparuk Development Area of Prudhoe Bay and that density of calving caribou declined exponentially with road density. With increasing infrastructure over years, high-density calving shifted to undeveloped areas inland with lower forage biomass. Caribou in July and early August were relatively unsuccessful in crossing road/pipeline corridors and both abundance and movements of female caribou were lower in the oil field complex at Prudhoe Bay than in other areas along the Arctic coast. The scale of analysis may be important (Vistnes and Nellemann 2008). Following the establishment of the oil field network of roads and pipelines, a reduced portion of the caribou herd that remained continued to occur within the oil field complex, but the distribution of those caribou was found to be unrelated to distance from infrastructure (Cronin et al., 1998, Noel et al., 2004).

In addition to avoidance of human activities at facilities, studies have documented avoidance of lightly used linear corridors (mostly seismic lines) by woodland caribou; most likely due to greater wolf use of these features (James and Stuart Smith 2000). The studies also documented woodland caribou avoid the area within 14 km of infrastructure in a diamond mine complex, which was thought due to dust deposition (Boulanger et al., 2012).

A small area of infrastructure (footprint) may impact wildlife in the surrounding area much more than might be expected. Despite measuring only one percent of their study area as developed (well sites, roads, seismic lines), Dyer et al., (2001) calculated that twenty-two to forty-eight percent of the area would receive reduced use by caribou. Similarly, Johnson et al., (2005) estimated that three uranium mines, a 20 km road, and scattered outfitter camps and mineral exploration activities within a 190,000 km² study area may have resulted in a “37 percent reduction in the area of the highest quality habitats and an 84 percent increase in the area of the lowest quality habitats.”

Caribou in open habitats will likely avoid human infrastructure at greater distances than caribou in forested habitats. Hunted wildlife populations may exhibit greater reaction to human disturbance than unhunted populations. Animals can respond to roads and trails with little traffic. For example, a hunted population of elk in partially forested habitat in Oregon showed significant selection for areas farther from roads which had as little as one to four vehicles per 12 hours (Wisdom et al., 2005b) and showed an increased probability of flight response to ATV and mountain bike traffic at distances of 1,500 meters (Wisdom et al., 2005a). Increased access provided by roads and trails may benefit hunters using motorized vehicles (including subsistence hunters), but may increase poaching rates and may increase the difficulty of managing hunting seasons, due to increased harvest rate.

Population level impacts resulting from caribou avoidance of infrastructure and activities are not well understood. Cameron et al., (2005) reported that female caribou exposed to petroleum development west of the Sagavanirktok River had significantly lower parturition rates, which likely reduced herd productivity. The Central Arctic caribou herd population increased greatly during the period of oil development. Population increase, however, may have been slowed and future decreases may be magnified, especially if infrastructure continues to expand to other

areas used by caribou for calving and insect-avoidance (Cameron et al., 2005). An analysis of boreal caribou herds in Canada (Environment Canada 2008) showed that the number of calves per 100 cows in fall was negatively related to percent of the herd range disturbed. Both studies included habitats with greater size and density of infrastructure development than are anticipated on BLM lands in the planning area.

Potential effects of mining road and facility development on Dall Sheep:

Distributions and activities of the closely related bighorn sheep have been shown in many studies to be negatively influenced by human activities and OHV use (Canfield et al., 1999), however, a few studies have indicated little or no affect from recreational activities (e.g., Wehausen 1977). Each individual animal, population and situation may be unique and factors which may influence the degree of apparent effect include type of disturbance, habitat, the history of human interaction with that sheep population, and even study methods. Wild sheep can habituate in some situations to some human activities. Even in situations where sheep use habitats in proximity to human disturbance and appear to be habituated, however, impacts may still be occurring (such as altered behavior, increased energy expenditures, changes in used habitats). Papouchis et al., (2001) showed that even in an area with a considerable human activity (Canyonlands National Park) and a long history of human use, although some individual sheep appeared to habituate to road activity most did not. All sheep were disturbed by off-trail hikers. The researchers documented avoidance by sheep of a road corridor that resulted in reduced use by sheep of twenty to thirty-six percent of all suitable habitat in the study area.

Acute and chronic stress (including higher heart rates and levels of stress hormones) may also be occurring despite calm appearances among disturbed sheep (MacArthur et al., 1982). Heart rate in bighorn sheep is elevated when sheep are occupying less secure habitats (e.g., greater distances from escape terrain or lower visibility; Hayes et al., 1994). Although sheep may appear to habituate to human presence, especially in areas where resources of high value are found (e.g., mineral licks or fertilized grasses), human activities may continue to cause stress, increased energy expenditures, and reduced use of preferred habitats (Keller and Bender 2007). In some situations, mines can create habitat features attractive to wild sheep which may be beneficial (Elliott and McKendrick 1984, Bleich et al., 2009).

Dall sheep are assumed to be similar to bighorn sheep in sensitivity to disturbance, but few studies have been conducted. Loehr et al., (2005) found sheep increased vigilance behaviors and ewes decreased bedding and increased foraging when in presence of humans on foot. Dall sheep in the White Mountains typically fled when approached to within one-quarter mile by a hiker and extreme flights of several miles occasionally resulted (Herriges, unpublished data).

Sheep in the planning area typically occur in small subpopulations in scattered areas of adequate habitat. Small habitat patch size results in reduced probability of population persistence (Singer et al., 2001). Several subpopulations use mineral licks which occur at substantial distance from secure sheep habitats. Human facilities and activities which reduced the ability of sheep to move freely between subpopulations or to access peripheral habitats and mineral licks could effect long-term sheep populations.

Bears, wolves, and wolverines have also been shown to avoid or be negatively influenced by roads and human activities. However, wolves also utilize linear features, such as trails and roads, as travel routes (and may benefit from that use) and any of these species may be attracted by human foods.

Effects from Salable Minerals

Mineral material disposal has both direct and indirect impacts on wildlife and their habitats. There is typically a direct loss of habitat with disturbance of the site. Sites are often left open for future potential uses. Once sites are reclaimed, they may recover within a relatively short time, but more typically will require decades to recover. During recovery, early seral vegetation may benefit some species. Temporary displacement of some animals may occur, especially to sensitive species such as nesting raptors, although application of ROPs (Appendix A, *Required Operating Procedures and Fluid Mineral Leasing Stipulations*) will reduce disturbance of priority raptors. Direct mortality may occur during disturbance of non-mobile species, but larger impacts will result from the long-term use and potentially lengthy vegetation recovery.

Few mineral material disposal actions are anticipated on BLM lands during the life of the plan. No more than 200 acres of authorized disturbance on BLM-managed lands are anticipated necessary to meet demands over the next 20 years. There are currently there are 160 acres of potential disturbance authorized. No new sites are anticipated away from existing roads. Impacts to wildlife at a regional level from mineral material disposal would be minimal under all alternatives at predicted levels of use, but local effects will occur.

Effects from Recreation

Recreational activities can impact wildlife in a number of ways. Some level of disturbance of wildlife is generally associated with most outdoor human activity. Habituation to human activities may or may not occur, include more than a few individuals, or be complete. Effects of disturbance typically include increased energy expenditure due to movement away from the activity and avoidance of the activity or area for the short- or long-term. Disruption of behaviors can also result in lower probability of survival of young. For example, a nesting raptor may leave its nest during weather conditions hazardous to nestlings, or caribou calves may be prevented from utilizing insect avoidance habitats. Stress can also result in increased energy expenditure (as indicated by increased heart rate) and, if chronic, result in health affects such as lowered immunities to parasites. Effects of facility development and human disturbance are also discussed in “Effects of Locatable Minerals” above.

Facilities impact wildlife through direct loss of habitat, as well as displacement of wildlife through human use. The effects will depend on the level and history of use, wildlife species present, and habitat. High levels of visitors can impact vegetation by trampling. Bears may be attracted to garbage and as a result may need to be destroyed. River-floating recreationists can disturb wildlife using high-value aquatic and riparian habitats, including waterfowl with young. Nesting raptors may be briefly disturbed as floaters pass or disturbed for longer periods if camping or other sustained activities occur within sight of the nest. Motorized boat usage typically creates more disturbance due to noise, speed, unpredictability, and increased levels of traffic. Hunters may disturb wildlife, especially in situations where hunters are concentrated, such as occasionally occurs along the Taylor highway when caribou are abundant.

Effects from Renewable Energy

Renewable energy development can have many of the same impacts associated with infrastructure of mining discussed in “Effects from locatable minerals.” Wind generators and powerlines can result in mortality of birds, but can also be sited and designed to minimize this mortality. The potential for renewable energy development in the planning area is predicted to be very low.

Effects from Travel Management

Motorized vehicle use usually results in much greater numbers of visitors and trips in an area than non-motorized use. In addition, use of motorized vehicles may be more disturbing to wildlife and more damaging to wildlife habitats than non-motorized uses. Allowance of motorized vehicle use and the degree of control of motorized users is a primary difference among alternatives in potential impacts to wildlife and wildlife habitats. In the White Mountains and Steese subunits, the Primitive, Semi-Primitive, and Backcountry RMZs do not allow summer OHV use. These designations minimize potential recreation impacts to wildlife. (Summer OHV use is allowed in Backcountry RMZs in Fortymile subunit.) Non-motorized recreational use can also adversely affect wildlife, but typically the impacts are limited by difficulty of access and lower numbers of visitors. Non-motorized access also typically impacts vegetation and soils to a much lesser extent. All alternatives allow winter snowmobile use in all areas except the RNAs. Winter OHV use with adequate snowcover generally causes limited impacts to soils and vegetation, but may disturb resident wildlife.

Aircraft use (especially helicopters) has the potential to disturb wildlife, but aircraft use for recreation is usually limited to fixed-wing aircraft and focused on transport to one of a relatively few suitable landing sites. The levels of use seen currently in the planning area are not considered to be generally problematic.

Impacts of OHV use on wildlife:

Off-highway vehicle usage potentially affects wildlife species in several ways, including loss of wildlife habitat, disturbance of wildlife, and through the consequences of improved access. The potential impacts to vegetation (described in section 4.3.1.8 Vegetative Communities) can result in direct loss or modification of habitat. Wildlife habitat loss can also result indirectly from establishment of invasive plant species which can be facilitated by the combination of soil disturbance and seed carrying actions of OHVs. Potential wildlife habitat loss from OHV-facilitated weed establishment likely exceeds the potential loss from direct destruction of vegetation and soils.

Disturbance of wildlife can impact individuals directly and can also lead to loss of habitat through avoidance of the area. Disturbance distance in open habitats may be greater than in forested habitats. Wildlife may respond to disturbance by fleeing. If individuals remain in place, they will likely experience stress, as indicated by increased heart rate and other physiological responses. Many studies have shown that many big game species avoid areas near roads and trails (e.g., Wisdom et al., 2005a,b). Shanley and Pyare (2011) found that rural roads and OHV routes with little traffic reduced moose occurrence in a zone 500–1,000 meters distant from the road. Road and trail densities are frequently negatively correlated with abundance of large wildlife species. Where OHV use is limited to established trails, it is less disturbing to wildlife in degree and extent. Individual animals may learn that off-highway vehicles are likely to remain on the trail and are therefore more predictable.

Increased access into an area can also result in greater mortality of wildlife by legal and illegal harvest. Attraction to human foods and habituation to humans can result in removal of the animal. Predators such as grizzly bear, wolverine, and wolves frequently decline with increased access, through both mortality and avoidance.

Larger trails and allowance of larger OHVs, such as UTVs create impacts more similar to those of roads. These will likely increase direct impacts to vegetation and habitat due to greater weight

and larger footprint and may increase disturbance due to larger numbers of passengers and larger camps and increase wildlife mortality resulting from access to human garbage. Constructed trails can also increase average speed of OHVs on the trail, which may be even more disturbing to wildlife.

Effects of Cross-country OHV Use:

Cross-country OHV use results in impacts to soils and vegetation (Vegetative Communities section 4.3.1.8). Increasing numbers of OHV users and resulting levels of off-trail use will increasingly affect wildlife habitat and populations. Off-trail use of OHVs is less predictable and thus more disturbing to wildlife than use which is limited to trails. Unregulated establishment of trails will often result in trails traversing and paralleling riparian habitats which are frequently the most productive habitats for many species. Trails will also become pioneered in other sensitive and productive wildlife habitats, where constructed/managed trails could be sited to avoid sensitive wildlife habitats. Off-trail use of OHVs can also crush small terrestrial species and bird nests. Construction or improvement of OHV trails can increase off-trail OHV use and associated impacts in more remote areas due to the improved access.

Open habitats in high-elevation sheep and caribou habitat may be easily traversed by OHVs, and as a result off-trail use can be extensive in area and affect vegetation cover and composition over a large area. Increased access provided by a network of trails could increase harvest of wildlife species, such as moose and caribou, to such an extent that more restrictive harvest regulations would need to be implemented. Winter use of trails created by summer OHV users may extend disturbance of sensitive wildlife habitats. Winter trails packed by snowmobile use can facilitate travel by predators and increase mortality rates of prey.

Cross-country OHV use is allowed in Alternatives A and D in all subunits. In these alternatives, habitat effectiveness for most wildlife species will be diminished somewhat by allowing continued proliferation of user-pioneered trails. The extent of this loss of habitat effectiveness is dependent on uncontrollable factors such as the rate of increase in usage of off-highway vehicles, changes in capabilities of off-highway vehicles to traverse difficult terrain, effects of large wildland fires on rate of trail proliferation, increase in non-motorized use, and increase in the regional prevalence of invasive plant seed sources. With the exception of the generally remote Black River Subunit, the growth in off-highway vehicle use in some areas is potentially large, and minor impacts could accumulate.

Winter OHV (Snowmobile) use.

All areas except RNAs areas are open to small winter OHV (snowmobile) traffic. Snowmobile traffic has been demonstrated to result in disturbance of most northern ungulates. Within the planning area, where snowmobile use occurs in forested habitats, use is largely limited to cleared trails and small openings. The forest cover prevents or reduces off-trail travel and typically shields the activity from view of animals (which reduces the distance at which animals are appreciably disturbed). Where trails avoid high-value wildlife habitats and trail density remains low, the impacts to wildlife populations from a limited set of snowmobile trails in the forested areas (such as the White Mountains cabins and trails system) should be low. Snowmobiles are not similarly restricted to trails in open forest or non-forested habitats and as a result could potentially travel and disturb animals throughout a large area. In addition, animals located in non-forested habitats may be more sensitive to disturbance. Where open forest or non-forested habitats are accessible to snowmobiles, wildlife species may be impacted if use is frequent or widespread.

In addition to increasing energy expenditures, ongoing snowmobile use of these areas may cause animals such as caribou or sheep to abandon that area. Current off-trail use of open areas on BLM lands in the planning area is generally low and such use is not anticipated to increase greatly. Localized impacts to wildlife may occur in some areas, and these may increase where access is improved. Monitoring of snowmobile use and appropriate planning and management of winter trails could ameliorate impacts to caribou and other species.

Packed snowmobile trails provide routes for wolves that facilitate more efficient travel, which may increase rates of encounter of prey species and increase predation rates. RMZs which maintained low densities of roads and trails (e.g., Semi-Primitive or Backcountry) would minimize such effects. Travel management planning can also avoid routing groomed snowmobile trails into non-forested caribou range or other sensitive habitats or close trails which result in excessive snowmobile use in such areas. Groomed trail density is currently greatest in the White Mountains Subunit and is considered to have only minor or localized impacts to winter wildlife at current levels and patterns of use.

Effects from Hazardous Materials and Abandoned Mine Lands

Cleanup of existing hazardous materials and prevention of new spills or deposits will benefit wildlife resources by reducing potential animal exposures and effects on habitats. Rehabilitation of abandoned mine lands will generally benefit wildlife, especially those that restore key habitats such as riparian areas.

Effects from Subsistence

The management of federal lands to maintain subsistence resources will benefit wildlife resources. The direction in ANILCA to manage Wild and Scenic River corridors to “cause the least adverse impact possible on subsistence values” will benefit wildlife resources. Subsistence harvest of wildlife is regulated and the harvest of vegetative materials for subsistence use is generally low and dispersed. Motorized vehicle use by federally qualified subsistence users could potentially impact wildlife in some circumstances, but such use is generally provided for by ANILCA.

4.3.1.12.2. Alternative A (No Action)

Effects from Wildlife

Although grazing of livestock is not currently allowed except in the Fortymile MFP, no restrictions on casual use of domestic animals, such as goats and llamas, as pack animals are in place anywhere in the planning area.

4.3.1.12.3. Alternative B

Effects from Wildlife

No use of domestic goats, sheep, llamas or similar animals would occur in Dall sheep habitat, reducing the risk to very low levels. However, use in adjacent areas could result in inadvertent contact because Dall sheep do use areas outside primary ranges (and can wander long distances) and escapes of domestic animals may occur.

4.3.1.12.4. Alternative C

Effects from Wildlife

No use of domestic goats, sheep, llamas or similar animals in Dall sheep habitat by operations requiring a permit from the BLM would be allowed. This would reduce risk of disease transmission from the No Action Alternative only slightly, because most use of domestic goats or llamas is likely to be by non-permit holders (such as the general public). Consequences of disease transmission could be major and have long-term impacts on Dall sheep populations.

4.3.1.12.5. Alternative D

Effects from Wildlife

Same as Alternative C.

4.3.1.12.6. Cumulative Effects

State Land Disposals

In some parts of the planning area, state lands adjacent to BLM lands are open to disposals, such as sales of recreational lots. Activities associated with these lands may affect wildlife resources on BLM lands, including road and trail development. Along the west side of the south unit of the Steese NCA, a large area of state land is designated for disposal. Several sales of recreational lots in this area have occurred. Some land owners in such an area near the southern boundary of the White Mountains NRA use BLM trails to access their parcels. Other state land sale areas are adjacent to portions of the Dennison and Mosquito forks of the Fortymile WSR Corridor. Settlement is currently not allowed in Region 1 of the Upper Yukon Area Plan, which includes a significant portion of the current Fortymile calving area.

Mineral Development

Development of minerals will occur on state and private lands in the planning area. Effects will be similar to those described for activities on BLM lands, except that the level of activity is expected to be much higher, as the state and private lands generally have higher mineral potential.

Large lode mines are not predicted to occur during the 20-year life of the plan on BLM lands, except for the Money Knob Mine, which involves only isolated federal mining claims. Additional lode mines on BLM lands could potentially occur, either within the life of the plan or later. One pre-feasibility exploration project is predicted for the Steese Unit, which could later be developed into a large mine. Large lode mines involve a large area of surface disturbance, permanent change to the landscape, high levels of human activity on-site and involved in transport, and typically require large, high-standard road access with considerable traffic. Access may be requested across BLM lands for mines located on non-BLM lands, resulting in direct and indirect impacts.

Opening an area to mineral entry and location may have long-term consequences because a mineral claim may be maintained indefinitely before being developed. In addition, patent of mining claims, in the unlikely even the current moratorium is lifted, could result in holdings of private land within public lands, resulting in long-term habitat loss and fragmentation, wildlife disturbance, and impacts associated with access.

Forest and Woodland Products

Commercial development of forest products will occur on state and private lands in the planning area, mostly in lower-elevation areas close to road access. Roads created for other purposes may be utilized for access to forest products. For example, the State of Alaska Upper Yukon Plan recognized the potential for forest product sales in the remote North Fork region, through possible access from the west. The Pogo Mine road, which has since been completed, extended the existing forest road east.

R.S. 2477 Rights-of-Way

Access to and across BLM lands, including motorized access, may be granted along R.S. 2477 rights-of-way. Currently, R.S. 2477s are not recognized by the BLM, but court decisions or negotiations with the State of Alaska could result in allowance of access along these routes and/or granting of rights-of-way. For example, the BLM recently granted a right-of-way along the Harrison Creek R.S. 2477 within the Steese NCA. Impacts of access would be similar to those described for motorized vehicle use on BLM lands for locatable minerals and recreation.

Aircraft activity

Other than as a condition of a permit for land use, the use of airspace is not controlled by BLM. Military aircraft utilize airspace over all of the planning area, and most of the BLM lands in the planning area (but not including the White Mountains subunit) are underneath Military Operations Area (MOA) airspace. MOA airspace is utilized both for routine flying and major exercises and in most of the MOAs aircraft are allowed to fly at 100 feet above ground level.

Military overflights have been related to lower caribou calf survival (Harrington and Veitch 1992). Davis et al., (1985) found no evidence of long-term population effects from frequent military and civilian aircraft activity to the Delta caribou herd. However, noise monitors and activity-sensing collars were used in the Delta Herd to document behavioral changes in caribou exposed to overflights, which included shorter resting bouts and increased daily movements (Murphy et al., 1993, Maier 1996, Maier et al., 1998). Most researchers studying the effects of aircraft overflights on caribou have suggested that female caribou with young calves are more sensitive to aircraft overflights than caribou of other sex and age categories and that mitigation is particularly important in the calving and postcalving seasons (Miller and Gunn 1979; Harrington and Veitch 1991; Murphy et al., 1993; Maier et al., 1998).

Magoun et al., (2003) observed reactions of Fortymile caribou to military aircraft overflights and concluded that short-term responses to overflights were generally mild in comparison to caribou reactions to predators or perceived predators. They also advised against assuming there are no long-term effects on calving caribou from jet overflights. Determining long-term effects would be difficult and they advised that "Without this information and with the potential for increased military jet training in the Yukon MOA, a conservative approach is advisable."

Lawler et al., (2005) observed Dall sheep reactions to military overflights and noted few substantial reactions. During observation periods, however, few overflights occurred in close proximity to observed sheep. Dall sheep are likely to be more sensitive to disturbance in areas where they feel less secure, as indicated by the following observation made by BLM biologists: Sheep in the vicinity of Puzzle Gulch (an area with very limited escape terrain) reacted more strongly to passage of two military jet aircraft at a distance of approximately one mile from

the sheep than any recorded reaction in the Lawler et al., (2005) study (Herriges, unpublished data, J. Lawler, pers. comm.).

Other studies of effects of military aircraft activity on neotropical passerine birds (Bartecchi 2003) and nesting peregrine falcons (Ambrose and Donaldson 2004) did not document major impacts at current levels of aircraft activity.

The amount of military aircraft use allowed in the MOAs (in the MOA EIS) is considerably higher than has occurred since their establishment and during any of the recent studies on effects to wildlife species. Impacts to wildlife in some areas could potentially occur at high levels of military aircraft activity. In recent years, the Air Force has voluntarily avoided scheduling Major Flying Exercises during caribou calving and has instituted mitigation measures (raised minimum altitudes near known concentrations of calving caribou) to reduce potential impacts to the herd. These measures have likely resulted in little impact to caribou from Major Flying Exercises, but greater impacts could occur in the future if aircraft activity increases to nearer the allowable limits or mitigation measures are not followed.

Other aircraft activity over BLM lands in the planning area includes commercial commuter aircraft. This activity normally occurs at high altitudes, but in some areas (where flight paths intersect high terrain) flights are at low level above ground. The highest amount of this activity likely occurs in the White Mountains NRA. To some extent, this activity may have acclimated wildlife to at least some types of aircraft activity. Typically, commercial flights occur in one direction with no circling, and this nature may facilitate habituation. Aircraft flights along Beaver Creek can be numerous because it is used often during low cloud conditions to travel between Yukon Flats and Fairbanks.

Climate Change

Climate change will result in major ecosystem changes in the planning area, with corresponding effects on wildlife habitats and populations. Some species will benefit, others will be negatively affected. Significant changes to wildlife communities due to climate change have been predicted (Lawler et al., 2009). During the next 30 years, the expected impacts on individual eastern Interior Alaska wildlife species from predicted changes in climate are not all clear. The biggest change in the planning area, where wildland fire is a part of the ecosystem, will be due to a predicted increase in fire frequency (Rupp and Springsteen 2009b, Rupp et al., 2006). A shift from mature coniferous forest-dominated landscape to a younger deciduous forest and shrub-dominated landscape is predicted to occur as a result. The loss of older spruce forests (more than 80 years) is likely to be substantial. This predicted shift will be a major ecosystem-level change and may result in large shifts in wildlife species distribution and abundance. Between 1990 and 2050, the mean fire return interval for the entire planning area is predicted to change from 250 years to 100 years, and simulations show an increase in deciduous vegetation (forest and shrub) from 10.7 to 75.6 percent of landscape.

As a result of the shift in fire frequency and vegetation dominance, species dependent on early seral stage communities will in general benefit from climate change; and those dependent on older seral communities will likely be negatively affected. New species will expand their distribution into the planning area within the next 30 years, with unpredictable effects on resident wildlife species. Habitat change from spread of NIP could be large in at least some habitats.

Summers are predicted to receive more precipitation, but be relatively drier due to increased temperatures. Insect damage to trees and moisture stress on white spruce trees could result

in major declines in those species which, in addition to increased fire frequency, could result in relatively little white spruce forest on the landscape. This would impact mature white spruce-dependent bird species such as Townsend's warblers. As permafrost has receded, ponds and small lakes have dried (Riordan et al., 2006) and this trend will likely continue, perhaps aided by the summer moisture deficit. Lower creek and river flows are also likely. These changes will negatively affect waterfowl, shorebirds and aquatic wildlife such as beaver and muskrats. Species with only arctic and subarctic or alpine distribution may be most likely to be negatively impacted by climate change, including species such as gyrfalcon and ptarmigan. Extreme weather events are predicted to increase in frequency and can have major impacts to wildlife populations.

Caribou—Climate change is predicted to dramatically change forests in Interior Alaska and a predicted increase in wildland fire occurrence will drastically reduce old age spruce lichen stands and reduce traditional winter lichen forage (Rupp and Springsteen 2009b). Using moderate climate change scenarios, the decline in stands of spruce less than 80 years old is predicted to be roughly forty percent from 1990 to 2050 and the mean fire return interval will decline from 250 to 100 years. This will result in major reductions in available lichen forage. Currently, winter range is not considered to be limiting, so impacts of this reduction will depend on the population level of caribou and the extent of winter range available, including other herds that may be using the available winter range.

At a minimum, increased wildland fires will result in wider winter travel by caribou in search of available lichen forage. More frequent wildland fires and the shift from coniferous to deciduous forest dominance will likely foster increased moose densities and, as a result, increased wolf densities, which would likely increase predation rates on caribou. Predicted increased summer temperatures and drier conditions will likely reduce condition and pregnancy rates of caribou. Harassment by insects may also increase with higher summer temperatures. Increased shrubs and decreased lichen may occur in alpine habitat and a slowly rising treeline may reduce extent and quality of summer and fall range. Increased incidence of rain-on-snow events could impede winter foraging. Expanded ranges of some parasites and increased abundance in the environment are expected to affect caribou. Although some aspects of climate change could be positive, such as earlier summer greenup of vegetation, in balance, the effects on caribou populations are more likely to be negative. Across the north, a majority of large caribou herds monitored are in decline and the synchronous nature of these trends and observed effects on some herds of extreme weather events implicates climate change as a primary cause (Vors et al., 2009), although other human influences such as development and harvest may also be involved.

Dall Sheep—It is difficult to predict the effects of climate change on Dall sheep habitats. In low-elevation sheep habitats where forest is found in close proximity to escape terrain, an increase in fire frequency may result in improvement in short-term creation of new foraging habitats and improvement in forage quality. In most areas of sheep habitat, an ongoing rise in treeline could reduce the extent of sheep habitat, but that rise is expected to be slow. An increase in shrubs in alpine tundra (as is occurring in arctic tundra) would reduce quality of Dall sheep habitat, especially in winter when they would hold snow. The main impact of climate change may come from a combination of a predicted increase in winter temperatures (which will result in increased incidence of winter rain/icing events) and an increase in winter precipitation. Earlier green-up and longer growing seasons may be beneficial, but drier soil conditions could reduce forage quality. Dall sheep rely on alpine slopes which are blown free of snow and on areas of shallow, uncompacted snow for access to forage in winter and populations are commonly thought to be regulated by winter weather. Heavy snow winters and/or instances of freezing rain or heavily crusted snow could have serious consequences for sheep populations, depending on the severity

and frequency of those events. These consequences would likely outweigh positive effects of climate change and so the overall impact of climate change on Dall sheep is likely to be negative.

Moose—The large area burned since 2004 has likely already benefited moose and the predicted increase in fire frequency and resulting shift towards a more deciduous-dominated landscape will likely continue to benefit moose. Negative effects of climate change for moose include a predicted increase in winter precipitation, which may result in periodic excessively deep snow years, and increased summer temperatures which could result in some heat stress. Deep snow and heavy browsing were responsible for a crash of Tanana Flats moose populations in 1965–1966 (Gasaway et al., 1983). The overall effect of climate change on moose is uncertain, but a shift to early seral and deciduous vegetation will likely result in overall beneficial effects.

Potential Cumulative Effects to Caribou

Caribou are a very important species in the Planning area, both ecologically and culturally. Caribou are wide ranging and the Fortymile caribou herd ranges into all four subunits (though rarely in Upper Black River Subunit) and far into Canada as well. This large range with many landowners increases the potential for significant accumulation of effects. In addition to the BLM, major land managers in the Fortymile caribou herd range include State of Alaska, National Park Service (Yukon-Charley Rivers National Preserve), BLM, Doyon, Limited, and Government of Yukon Territory. Only the NPS has a mission focused on resource preservation and it manages twenty-nine percent of lands in the core calving area. Doyon, Limited, is a corporation with a focus on resource development; and the BLM and State of Alaska have multiple use missions. The State of Alaska may also sell land. In the Fortymile subunit especially, many BLM lands have recently been, or will soon be, conveyed to Doyon, Limited, and other Native corporations and the State of Alaska. The State of Alaska and Native corporations are selecting lands with relatively high mineral potential (or other resource development potential), leaving what are currently thought to be mostly lower potential lands under BLM's management. As a result, resource development activities which may impact Fortymile caribou are likely to be concentrated on state and private lands in the area. Relative to these, activities on BLM lands are likely to represent smaller impacts to Fortymile caribou habitat. The BLM lands, however, include some of the most highly used habitats for calving and postcalving. In the core calving area, thirty percent is within BLM lands, and that proportion is higher in the highest density calving areas. As other lands in calving/postcalving habitats are developed, BLM and NPS lands may become more important to Fortymile caribou. The main historical calving grounds of the Fortymile herd for much of the previous century occurred in the White Mountains NRA and north Steese NCA. Access to the historical calving grounds requires migration across a zone of state land along the Steese Highway mostly open to mineral entry and currently with extensive areas of mining claims.

Increased fragmentation of Fortymile caribou habitats is expected to occur from a variety of activities and the access created for them. Most of the highest density recent calving habitat for the Fortymile herd occurs south and east of Yukon-Charley Rivers National Preserve. Lands have been selected in those areas by Doyon, Limited, and the State of Alaska for conveyance. The Pogo Mine occurs just to the west of calving/postcalving range and a potential mine at Slate Creek (Goodpaster River tributary) occurs closer to that range. The Little White Man prospect, the site of a likely lode development, and other prospects in the vicinity occur to the east of Pogo. More than two townships of land centered upon Mount Harper have recently been conveyed to Doyon, Limited, presumably for their mineral potential, and this is the center of a very highly used calving concentration. Extension of a road east from Pogo towards Mount Harper was considered as a scenario for cumulative effects analysis in the Pogo Mine EIS.

Filings of R.S. 2477 rights-of-way, although not recognized at this time by the BLM, indicate potential additional routes upon which access might someday be developed. Any exploration, mines and access (and additional development associated with and facilitated by that access), on BLM lands in the Fortymile calving/postcalving range could add to the cumulative impact of other development in the area. The Fortymile calving/postcalving habitats most likely to become unused or less used due to foreseeable future development are the historical calving grounds in the White Mountains/north Steese and one of the areas of highest current calving density in the Mount Harper/upper Middle Fork Fortymile River area .

Although predictions of new mining activity during the life of the plan are moderate (in part due to the length of time required to develop large mines), the opening of large areas of caribou habitat to locatable minerals could, in certain economic conditions, potentially result in extensive development within caribou habitat, including migratory habitats. Extensive areas of mining claims may be staked and maintained for many years and developed later.

The effects of climate change— combined with the effects of potential development on state land and private land of mining and exploration operations; military and other aircraft overflights; forestry and biomass harvest; state land disposals; recreational activities (including OHV use); and, transportation corridors associated with these and other activities— when combined with that occurring on BLM lands may be substantial. It is not possible to predict these activities and changes accurately, but there is at least the possibility that they may combine to create substantial impacts on caribou.

In Alternative B, the contribution of BLM actions to cumulative impacts to caribou will be negligible. Most of the recent and historical calving and postcalving habitats on BLM lands are designated as ACECs. Alternative B provides the most protection to caribou calving/postcalving from potential impacts of mining and motorized vehicle use (of action alternatives) and restricts cross-country OHV use. Of the current most highly used (core) calving habitat of the Fortymile caribou herd, fifty-nine percent is closed to mineral entry (BLM and NPS lands).

In Alternative C, the contribution of BLM actions to cumulative impacts to caribou will be somewhat greater. Most of the recent and a portion of the historical Fortymile calving and postcalving habitats on BLM lands are designated as ACECs and are closed to mineral location and entry and leasing of minerals. OHV use will be limited to designated or existing routes in all SRMAs. However, a smaller portion of the current general calving range of the Fortymile herd is closed to mineral entry in Alternative C than Alternative B, but within the core calving area, the same fifty-nine percent is closed to mineral entry (BLM and NPS lands). The migration corridor in the vicinity of the Steese Highway is mostly open to locatable minerals.

In Alternative D, the contribution of BLM actions to cumulative impacts are potentially considerably greater. Almost all caribou calving/postcalving habitats on BLM lands in the Fortymile subunit are open to mineral location and entry and mineral leasing. Of the current Fortymile caribou core calving area, only twenty-nine percent is closed to mineral entry (all in Yukon-Charley Rivers National Preserve). Also in Alternative D, greater development of calving/postcalving and migration habitats in the Steese NCA and White Mountains NRA are allowed. More area is open to mineral location and entry and mineral leasing and areas open to motorized vehicle use. Cross-country use of small summer OHVs are allowed. In the White Mountains NRA and Steese NCA, other management objectives (such as RMZ designations) provide some protection to caribou habitats outside of ACECs. In this alternative, the impacts of potential mineral development in migration habitats in the Steese Highway area

and in calving/postcalving habitats in the Fortymile, along with other cumulative impacts, could potentially become substantial.

4.3.2. Resource Uses

4.3.2.1. Forest and Woodland Products

Summary of Effects

Since no restrictions are proposed under any alternative for recreational use of timber or for personal use of forest products, there would be negligible effects to these activities under all alternatives. The area closed to personal use of timber would range from: zero acres in Alternative A; 2.5 million acres in Alternative B; 331,000 acres in Alternative C; and 840 acres in Alternative D. Closures to commercial use of timber and forest products would be similar in that the largest area closed in Alternative B and the smallest in Alternative D.

BLM lands would not be a significant source of timber. Other areas, in particular the Tanana Valley State Forest, offer much better opportunities for timber harvest. In areas that are open, measures to protect other resources, such as limits on the method, timing, and amount of harvest, would be required. Implementing closures to protect resource values would result in the loss of some available acreage and opportunities for harvest of timber and forest products. These restrictions and closures would have minimal impact on the Forestry Program, primarily due to low timber values and lack of access.

Special Designations would have the largest effect on the Forestry Program, but effects would still be small. The three WSR corridors provide some of the better opportunities to harvest the more valuable white spruce trees, particularly those portions of the Fortymile WSR where there is road access. Commercial timber harvest would be excluded from the WSR corridors and RNAs in all action alternatives. Restrictions on harvest would apply in ACECs. Loss of potential harvest areas in RNAs, ACECs and even WSRs would have a minimal effect, due to the remote and inaccessible nature and generally limited forest resources found in these areas. The strong emphasis on recreation within the White Mountains NRA, Steese NCA, and Fortymile WSR and the desire to protect visual resources would also likely lead to greater restrictions.

The following resources, resource uses, or programs would not affect Forest and Woodland Products and are not analyzed further: Air and Atmospheric Values, Cave and Karst Resources, Lands and Realty, Travel Management, and Vegetation Management, Withdrawals, Hazardous Materials, and Subsistence.

4.3.2.1.1. Effects Common to All Alternatives

Effects from Cultural and Paleontological Resources

Cultural and Paleontological resources would have minimal effects on Forestry. Minor restrictions on timber harvest could apply to avoid and minimize disturbing cultural and paleontological sites.

Effects from Fish and Aquatic Species

Measures to protect or restore healthy, functioning watersheds, riparian areas, and associated fish habitat would have minimal impact on the Forestry Program, primarily due to the low level

of timber and forest product harvest anticipated. Implementing riparian buffers in Riparian Conservation Areas and reducing impacts to aquatic habitats in other areas would result in the loss of some available acreage and opportunities for harvesting timber. In areas that are open to harvest, additional restrictions could apply; including limits on the method, timing, and amount of harvest.

Effects from Non-Native Invasive Species

Management to prevent invasion and spread of non-native species, would have a minimal impact, primarily due to the low level of timber and forest product harvest anticipated. Additional restrictions on timber harvest could apply to prevent the introduction or spread of non-native species.

Effects from Soil and Water Resources

Protecting soil and water resources and reducing impacts to watersheds could indirectly result in some loss of available acreage and opportunities for harvesting forest products. Buffers or avoidance areas generally near streams, along with possible seasonal restrictions, could reduce potential harvest areas. Other areas not closed to timber harvest, may also require such restrictions, making harvest uneconomical and creating additional lost opportunity.

Effects from Special Status Species

Measures to protect and preserve Special Status Species would result in direct effects to all forest activities that impact these species. Under all alternatives, the harvest of timber and forest products in areas containing sensitive, threatened, or endangered species could be restricted, relocated, or excluded to avoid resource damage. The presence of Special Status Species in the planning area, however, is limited and impacts would be minimal.

Effects from Visual Resource Management

Protecting visual resources and reducing impacts to viewsheds could result in the loss of available acreage and opportunities for harvesting timber and forest products. Much of the potentially harvestable timber is within the WSR corridors or within economically accessible distances from roads. These areas would typically be managed for higher visual resource protection, resulting in harvest restrictions to reduce impacts to visual resources. Restrictions could include limits on the method, timing, location, and amount of harvest.

Effects from Wilderness Characteristics

Under Alternative A there would be no effect as areas to be maintained with wilderness characteristics since none have been identified. Under Alternatives B, C, and D, various acreages of lands with wilderness characteristics to be maintained are identified. Though a considerable amount of acreage proposed as open to various forest harvest activities overlaps with areas where wilderness characteristics would be maintained, few impacts would occur. Areas where wilderness characteristics are to be maintained are generally remote and offer minimal harvest potential. Managing for wilderness characteristics could preclude timber harvest or restrict the method, timing, and amount of harvest.

Effects from Wildland Fire Ecology and Management

Opportunities may arise to combine fuel treatments and timber harvest to benefit local communities. Post-fire salvage could offer potential for harvest sites. Managing under a Limited Fire Management option could result in the loss of timber that might otherwise be available for harvest. These effects would be limited due to the lack of commercially valuable timber.

Effects from Wildlife

Protecting suitable habitat and reducing impacts to wildlife could result in the loss of some available acreage and opportunities for timber harvest. The method, timing, and amount of harvest could be restricted. Overall impacts would be limited based on the assumption that most restrictions to protect wildlife would be seasonal and that timber values are low.

Effects from Minerals Management

Development associated with minerals management could enhance access to otherwise uneconomical timber harvest areas. These sites are more likely to be in less sensitive areas and thus would be more conducive to timber harvest.

Effects from Renewable Energy

Criteria for biomass utilization according to *Assessing the Potential for Renewable Energy on Public Lands* (BLM and DOE 2003) are not met within the planning area. However significant and growing demand does exist for biomass utilization for personal and possibly small-scale community use. The plan allows for biomass projects in all alternatives, but only three to five small biomass projects are expected.

4.3.2.1.2. Alternative A (No Action)

Effects from Forest and Woodland Products

Under Alternative A 2.2 million acres would be closed to commercial timber sales and 1.2 million acres would be closed to commercial use of forest products. Personal use of timber and forest products could be allowed throughout the planning area. Although large areas are closed to these types of uses, effects would be minimal due to the low value of timber and lack of access to BLM lands.

Effects from Special Designations

Within the Beaver and Birch Creek WSR Corridors (156,000 acres), commercial timber harvest would be prohibited. Within the Fortymile WSR Corridor (248,000 acres), timber harvest could occur if consistent with managing for river values. Four RNAs (15,600 acres) are designated in the Steese NCA and White Mountains NRA. Commercial harvest of forest products would likely not be authorized within RNAs as it would not be consistent with the reasons for designation, and surface-disturbing activities are generally prohibited. Commercial use of timber would be prohibited in the Steese NCA and White Mountains NRA (inclusive of the RNAs).

The effect of these prohibitions or restrictions on the Forestry Program would be minimal due to the generally low value of the timber, lack of demand, and the inaccessibility of these areas.

4.3.2.1.3. Alternative B

Effects from Forest and Woodland Products

Under Alternative B, forest harvest activities would be much more restricted than in Alternative A. Approximately 3.1 million acres would be closed to commercial timber sales, and 2.5 million acres would be closed to commercial use of forest products and personal use of timber. Similar to Alternative A, the effects of these closures or restrictions would be small due to the low timber values and lack of access. Personal use of timber would not be allowed in the Steese NCA or the White Mountains NRA. This could have the effect precluding four or more applications for personal use firewood annually.

Effects from Recreation

Protecting designated recreation setting prescriptions and developed sites within designated SRMAs could result in the loss of some available acreage and opportunities for harvesting timber and other forest products. Effects would be minimal under Alternative B due to the fact that very limited forestry actions would be allowed to occur in SRMAs.

Effects from Special Designations

Under Alternative B, 2,869,000 acres in four areas would be designated as ACECs. The effect of these designations would be minimal, due to the fact that timber values are low and access to these areas is limited. Additionally, the Fortymile ACEC (732,000 acres) would be open to harvest of timber and forest products, consistent with protection of ACEC values.

The recommended designation of 98 miles of river under the National Wild and Scenic Rivers System could result in loss of opportunity for harvest of timber and forest products, including some areas that support the more valuable white spruce. These impacts would be minor due to generally low timber values, lack of access and lack of demand.

The Fortymile, Birch Creek, and Beaver Creek WSR Corridors (404,000 acres) would be closed to commercial use of timber and forest products. Although these areas support the more valuable white spruce, the effects of these closures would be minimal due to lack of access and demand. Additionally, any harvest authorized in the WSR corridor would have to be consistent with protecting the outstandingly remarkable river values.

4.3.2.1.4. Alternative C

Effects from Forest and Woodland Products

Under Alternative C, one million acres would be closed to commercial timber sales and 175,000 acres would be closed to commercial harvest of forest products. Personal use of timber would be prohibited on 331,000 acres. Effects on the Forestry Program would be minimal and less than under Alternatives A and B.

Effects from Recreation

Under Alternative C, Backcountry and Semi-Primitive RMZs overlap some areas where various types of timber and forest harvest would be allowed. No impact would be expected in these RMZs based on low timber values and lack of access. Areas where recreation could impact the Forestry Program include some Middlecountry and Frontcountry RMZs. These RMZs would have more developed recreational sites and place a higher value on protecting the visual setting for users. The location, method, timing, and amount of harvest could be restricted. Overall impacts would be low, based on current and anticipated future demand and low timber values.

Effects from Special Designations

The effects from RNAs would be the same as Alternative B.

Under Alternative C, 2,055,000 acres in four areas would be designated as ACECs. Similar to Alternative B, the effect of these designations would be minimal, due to the fact that timber values are low and access to these areas is limited. Additionally, the Fortymile, Steese, and White Mountains ACECs (1,434,000 acres) would be open to harvest of timber and forest products, consistent with protection of ACEC values.

No additional rivers would be recommended for designation under the National Wild and Scenic Rivers System. Thus there would be no effects. Designated WSRs would be closed to commercial timber harvest. Commercial use of forest products would be allowed on the “scenic” and “recreational” segments of the Fortymile WSR, increasing the acreage open to these types of use compared to Alternative B. The effects of these prohibitions would be minimal due to the lack of valuable timber, limited access, and lack of demand.

Similar to Alternative B, the Fortymile, Birch Creek, and Beaver Creek WSR Corridors (404,000 acres) would be closed to commercial use of timber. The “scenic” and “recreational” segments of the Fortymile WSR would be open to personal use of timber. Although these areas support the more valuable white spruce, the effects of these closures would be minimal due to lack of access and demand. The effects of opening portions of the Fortymile WSR to personal use of timber would be that it would provide additional opportunities for this type of harvest on 103,000 acres. Compared to Alternative B, an additional 259,000 acres within WSR corridors would be open to commercial harvest of forest products, providing additional commercial harvest opportunities for forest products. Any harvest authorized in the WSR corridors would have to be consistent with protecting the outstandingly remarkable river values.

4.3.2.1.5. Alternative D

Effects from Forest and Woodland Products

Under Alternative D, 433,000 acres would be closed to commercial timber sales, 30,000 acres would be closed to commercial use of forest products, and 840 acres in the Fortymile Subunit would be closed to personal use of timber. Although this alternative opens large areas to various types of timber and forest product harvest the effects would be minimal due to the low value of timber and lack of access on BLM lands.

Effects from Recreation

Same as Alternative C.

Effects from Special Designations

The effects from RNAs would be the same as Alternative B.

Under Alternative D, 1,545,000 acres in four areas would be designated as ACECs. The ACECs would be open to harvest of timber and forest products, consistent with protection of ACEC values. Similar to Alternative B, the effect of these designations would be minimal.

No additional rivers would be recommended for designation under the National Wild and Scenic Rivers System. Thus there would be no effects.

Designated WSRs (404,000 acres) would be closed to commercial timber harvest and open to commercial use of forest products. The entire Fortymile WSR would be open to commercial use of forest products, increasing the open acreage by 145,000 acres over Alternative C. Although this alternative would open additional acreage, effects would essentially be the same as Alternative C, due to lack of access in the “wild” segments of the Fortymile WSR. Additionally, the Beaver Creek and Beaver Creek WSRs would be open to personal use of timber, providing opportunities for harvest on an additional 156,000 acres compared to Alternative C. Increasing the acres open personal of timber products would have minimal effect, as demand is expected to remain low and there are alternative harvest areas on state lands that are more accessible.

4.3.2.1.6. Cumulative Effects

Warmer and drier conditions are expected over the life of the plan. The potential for increased frequency of wildland fire and stress to the forest ecosystems is expected. The possibility exists that increased interest may arise for salvage type harvest due to post fire availability and salvage of disease or pest infested trees. As for forest products such as berries and mushrooms, changes could be expected but are difficult to forecast. These effects would not vary by alternative.

The overall effect on the Forestry Program from planning decisions on BLM lands, in addition to restrictions in National Wildlife Refuges and National Preserves would result in additional loss of potential harvest areas. The demand for local harvest of timber, for home heating, saw logs and lumber, and biomass, is expected to increase. Higher fuel prices would lead to higher transportation and heating costs. Currently non-federal lands are able to meet this demand, with more accessible and feasibly recoverable timber. The cumulative effect to the Forestry Program would remain low, although activity is expected to increase slightly throughout the life of the plan. Cumulative effects would be the greatest in Alternatives A and B, somewhat less in Alternative C, and minimal in Alternative D.

4.3.2.2. Land and Realty Actions

Summary of Effects

The effects to the Lands and Realty program are minimal and would generally not vary by alternative. The primary effect under all alternatives would be the potential for requiring relocation, redesign, or denial of realty authorizations to protect other resources. The potential for adverse impacts decreases from Alternative B to Alternative C to Alternative D.

4.3.2.2.1. Effects Common to All Alternatives

There would be no foreseeable effects on Lands and Realty from the following programs, resources, or resource uses and they are not analyzed further: Air and Atmospheric values, Cave and Karst, Non-Native Invasive Species, Soil Resources, Vegetation Management, Wilderness Characteristics, Fire Management, Forest and Woodland Products, Renewable Energy, Travel Management, Hazardous Materials, or Subsistence.

Effects from Cultural and Paleontological Resources

If important cultural or paleontological resources were found on public lands, the proposed action under a realty authorization may need to be relocated, redesigned, or denied. The presence of

significant cultural or paleontological resources on public lands could prevent disposal of those lands through land tenure actions.

Effects from Fish and Wildlife, and Special Status Species

Proposed realty actions that would negatively impact the habitat of fish or wildlife species may need to be relocated, redesigned, or denied, depending on the level of effects. If critical habitat was designated for a listed species, it would become land tenure Zone 1 and would not be available for disposal actions.

Effects from Visual Resource Management

Management of visual resources would have minimal effects on most land and realty actions. VRM Class designations do not prohibit the issuance of authorizations, but would require modification of the proposed action to meet the visual resource management class objectives. Projects in VRM Class I and II areas would require more modifications than would projects in Class III and IV areas. In some cases, proposed projects could be denied in VRM Class I and II areas.

The only VRM Class I areas would be the “wild” segments of the Fortymile, Birch, and Beaver WSRs, and the RNAs in the Steese NCA and White Mountains NRA. The amount of VRM Class II lands would be limited under most alternatives and occur primarily in areas managed for a Semi-Primitive recreation setting or to maintain wilderness characteristics. VRM Class I designation could constrain or prevent some realty authorizations. This effect would be generally be limited in scope, because the status of these areas as WSR corridors and RNAs, their proposed management, and their generally remote locations, would limit the number and types of projects considered. Realty authorizations would be somewhat effected in VRM Class II areas, depending on the extent and permanence of any disturbance. VRM III and IV classifications would have minimal effects on lands and realty actions because projects can more easily be designed to meet the objectives for these classes. Under all VRM Classes, topography and other landscape features would often provide an opportunity to screen projects, further reducing the amount of modifications to the project itself.

VRM designations would have a limited effect because the number of realty authorizations likely to occur in Class I or II areas would be small. VRM Class I or II designation could have a large impact, in the event that an application for a project is denied because it cannot be redesigned or relocated to meet the VRM management objectives. In general, the potential for adverse impacts decreases from Alternative B to Alternative C to Alternative D because the acres under VRM Class I and II designation decreases.

Effects from Water Resources

If there are instances where proposed realty actions would have unacceptable impacts on the management of water resources or riparian habitat, the proposed action may need to be relocated, redesigned, or denied.

Effects of Minerals Management

There are few foreseeable effects on land tenure or land use authorizations from the use of fluid, solid, locatable, or salable mineral resources. If additional lands are made available for the staking of mining claims, there could be some increase in processing and granting of rights-of-way for

access to mining claims. In most cases, however, access would be authorized as part of the Plan of Operations under the mining regulations.

Effects of Recreation

There are few foreseeable effects on land tenure or land use authorizations from Recreation Uses. For those lands that would be managed for Primitive or Semi-Primitive settings, all reasonable alternatives (including relocation, redesign, mitigation, or denial) would be explored to avoid issuing rights-of-way or other authorizations that would be inconsistent or incompatible with the recreation opportunity setting.

Effects of Withdrawals

There are few foreseeable effects on land tenure or land use authorizations from adjustments to withdrawals. When some withdrawals are modified or revoked, more lands could become available for exchange and other means of disposal. In addition more lands would be available for mineral entry. As a result, there could be a small increase in processing and granting of rights-of-way.

4.3.2.2.2. Alternative A (No Action)

Effects of Special Designations

There are few foreseeable effects on land tenure or land use authorizations from Special Designations. For those lands under special designation, all reasonable alternatives (including relocation, redesign, mitigation, or denial) would be explored to avoid issuing rights-of-way or other authorizations that would be inconsistent or incompatible with the purpose and reason for which the lands were designated. Designated lands would be unavailable for disposal actions. Under Alternative A, these effects would be limited to 15,600 acres of designated RNAs in the Steese NCA and White Mountains NRA, and 404,000 acres in the Fortymile, Beaver Creek, and Birch Creek WSRs.

4.3.2.2.3. Alternative B

Effects of Special Designations

In addition to the effects discussed under Alternative A, all ACECs (2,869,000 acres) are designated as right-of-way avoidance areas under Alternative B. The effects of this would be minimal, as few requests for land use authorization are anticipated in ACECs due to their remote location and other management decisions in effect. The effects under this alternative would be slightly higher than under Alternatives C or D as more acres are designated as ACECs.

4.3.2.2.4. Alternative C

Effects of Special Designations

Only 1,628,000 acres would be designated as ACECs under this alternative and they would not be right-of-way avoidance areas. Effects on land and realty actions would be similar to those discussed under Alternative A. The effects under this alternative would be slightly less than under Alternative B, but greater than under Alternative D.

4.3.2.2.5. Alternative D

Effects of Special Designations

Only 1,360,000 acres would be designated as ACECs under this alternative. Effects on land and realty actions would be similar to those discussed under Alternative A. The effects under this alternative would be slightly less than under Alternatives B and C, because fewer acres are designated as ACECs.

4.3.2.3. Fluid Leasable Minerals

Summary of Effects

There would be no effects on geothermal and coalbed natural gas. Although decisions in Alternatives B, C, and D propose to close between 5,714,000 acres and 1,310,000 acres, to fluid mineral leasing, these closure decisions would have limited effect due to the lack of these resources on BLM-managed lands.

Effects to oil and gas would be limited due to the small amount of high potential resources on BLM-managed lands. Alternatives B, C, and D would open 977,000 to 3,644,000 acres to fluid mineral leasing subject to standard stipulations. Little interest in exploration and no interest in leasing is anticipated in any subunit under any alternative.

Alternative B would generate little interest in exploration or leasing, in part due to the extensive closed areas and leasing restrictions on open areas. Alternative C would open some of the high occurrence potential lands in the Upper Black River and Steese subunits. Alternative D would open more of the high occurrence potential lands, including some lands in the White Mountains Subunit. Regardless of these openings, little interest in exploration or leasing would be anticipated, even under Alternatives C and D. The unknown resource that underlies these lands would remain unattainable for the life of the plan.

4.3.2.3.1. Effects Common to All Alternatives

Fluid leasable minerals including geothermal, coalbed natural gas, and oil and gas have little development potential in the planning area. There is no development potential for geothermal or coalbed natural gas. The only hot springs on BLM-managed lands is Big Windy Hot Springs, which is designated as a Research Natural Area. Although Alternatives B, C, and D would open from 977,000 acres to 3,644,000 acres, to fluid mineral leasing these decisions would have no effect in relation to geothermal or coalbed natural gas.

There is limited potential for oil and gas in the Steese, Upper Black River, and White Mountains subunits. All three subunits contain areas of high occurrence oil and gas potential, based on conceptual USGS oil and gas plays (Map 96). BLM-managed lands lie on the margin of these plays and little development interest has been expressed in this part of the Yukon Flats Basin. Limited exploration has occurred in these subunits, particularly on BLM-managed lands. The oil and gas resource in the Upper Black River Subunit is virtually unknown, as there has been little seismic work and only three test wells drilled.

Even if the resource existed in commercial quantities, exploration and development of the potential oil and gas resource would be further deterred by additional restrictions imposed through

this plan such as ROPs and Leasing Stipulations. In all alternatives, there are areas with high oil and gas occurrence potential that conflict with environmentally sensitive surface values. Restrictions imposed to meet the goals of the RMP, would impact exploration and development by increasing the costs of these activities. The prospect for reduced profit would diminish interest and the potential leaseholder would look elsewhere. Interest in the Upper Black River Subunit would likely be negated by its remoteness and lack of infrastructure. Although Alternatives B, C, and D would open from 977,000 acres to 3,644,000 acres to fluid mineral leasing, these decisions would have limited effect in relation to oil and gas leasing.

4.3.2.3.2. Alternative A (No Action)

There are no active oil and gas leases in the planning area and leasing would not occur under Alternative A. The lack of NEPA analysis and the retention of ANCSA 17(d)(1) withdrawals would preclude leasing. As a result, exploration and development would not occur and those undiscovered fluid minerals resources would remain unavailable for development.

4.3.2.3.3. Alternative B

Under Alternative B, 974,000 acres in the Fortymile and 3,000 acres in the Steese subunits would be open to leasing, subject to the standard stipulations. The decision to open these areas would have no effect as there are no known high occurrence potential oil and gas lands in these areas.

An additional 44,100 acres in the Steese, White Mountains, and Fortymile subunits would be open to fluid mineral leasing, subject to no surface occupancy (NSO). NSO lands would include split-estate lands (5,000 acres) and the BLM lands near the village of Circle (41,000 acres). The NSO lands near the communities of Circle and Central contain high occurrence potential for fluid leasable minerals. NSO would not allow for any permanent facilities and given the size of the parcels near Circle, would likely make any potential oil and gas target uneconomical. Split-estate lands could be available through directional drilling, but adjacent lands would need to be open to development for this to occur.

Further deterring oil and gas leasing and development are the ROPs, Leasing Stipulations, and other regulations. Additional restrictions tend to cause a reduction in lease interest and overall lease value. Encumbrances posed by the ROPs and Leasing Stipulations also increase operating costs, which would have an impact on exploration. Higher operating costs associated with drilling restrictions would result in fewer wells drilled, potentially delaying or preventing a discovery.

The remaining 5,714,000 acres (eighty-five percent of the BLM lands in the planning area) would be closed to leasing (Maps 26, 32 and 37). Closed lands would include the Fortymile WSR, Fortymile ACEC, Fortymile SRMA, the Steese SRMA, the Upper Black River Subunit, and the White Mountains Subunit. These closures would have no impact in the Fortymile Subunit as there are no known high occurrence potential lands for oil and gas. Closed areas in the other subunits would include at least 300,000 acres of high occurrence potential lands. Any fluid mineral resource that may be present in these areas would be considered unavailable for the life of this plan.

4.3.2.3.4. Alternative C

Alternative C differs from Alternative B, in that the Upper Black River Subunit would be available to leasing, and portions of the Fortymile caribou herd calving habitat in the Fortymile

and Steese subunits would be available to leasing. Additionally, a larger portion of the Steese NCA would be open to leasing. Effects would be similar to Alternative B, but closures and restrictions would apply to fewer acres.

Under Alternative C, 3,018,000 acres in Fortymile, Steese, and Upper Black River Subunits would be open to leasing, subject to the standard stipulations (Maps 27, 34 and 38). Restrictive openings would include 475,000 acres open. In the Steese Subunit, openings would include approximately 100,000 acres of high occurrence potential lands. These decisions would have no effect in the Fortymile Subunit due to the lack of oil and gas resources. The minor constraints in the Steese and Upper Black River subunits would consist of seasonal restrictions in priority wildlife habitats and stream buffers in Riparian Conservation Areas. These could constrain the exploration and development phases by delaying a project, but would not have any effect on the production phase. These constraints would not impose a significant restriction for oil and gas exploration and production.

Approximately 3,241,000 acres (forty-eight percent of the BLM lands in the planning area) would be closed to leasing. Closed lands would include the Fortymile WSR Corridor, portions of the Fortymile ACEC, Birch Creek WSR Corridor, portions of the Steese NCA, and the White Mountains Subunit (except for 100 acres of split-estate lands). These closures would have no impact in the Fortymile Subunit as there are no known high occurrence potential lands for oil and gas. The closed areas in the Steese and White Mountains subunits encompass approximately 252,000 acres of high mineral occurrence potential lands that would be unavailable for exploration, development, and production of any oil and gas that may exist.

4.3.2.3.5. Alternative D

Alternative D makes the most lands available to fluid leasable minerals of any alternative (Maps 29, 36 and 40). The primary difference from Alternative C would be the opening of the Middlecountry RMZ in the White Mountains Subunit, the opening of additional acres in the Steese Subunit, and the opening of caribou calving habitat and the “scenic” segments of the Fortymile WSR in the Fortymile Subunit.

Under Alternative D, 3,644,000 acres in the Fortymile, Steese, and Upper Black River Subunits would be open to leasing, subject to standard stipulations, including 51,000 acres of high occurrence potential lands in the Steese Subunit. An additional 1,482,000 acres would be open, subject to minor constraints. Lands open to minor constraints would include 117,000 acres of high occurrence potential areas in the Steese Subunit and 25,000 acres of high occurrence potential areas along Victoria Creek, in the White Mountains Subunit.

The effects of these closures and seasonal restrictions would essentially be the same as described under Alternative B, but would apply to fewer acres. Minor constraints would be seasonal and could constrain the exploration and development phase in the sense of delaying a project, but would not have any effect on the production phase. Stream setbacks in Riparian Conservation Areas would not impose a significant restriction for oil and gas exploration and production. The seasonal constraints in the White Mountains Subunit (May 15 through July 15) could economically impact development projects, such as constructing and maintaining a pipeline or road. However, this impact would be minor.

The remaining lands, 1,310,000 acres (twenty percent of the BLM lands in the planning area) would be closed to fluid mineral leasing. Closed lands would include the “wild” and “recreational”

segments of the Fortymile WSR, forty-six percent of the Steese Subunit, and fifty-six percent of the White Mountains Subunit. As in Alternatives B and C, these closures would have no impact in the Fortymile Subunit. The closed areas encompass some high occurrence potential lands in the Steese NCA (87,000 acres) and the White Mountains Subunit (105,000 acres) which would be considered unavailable for exploration, development, and production of any fluid leasable mineral resources that may exist.

4.3.2.3.6. Cumulative Effects

There would be no cumulative impacts in the Fortymile Subunit under any alternative, as fluid minerals are not known to exist in commercial quantity. While there are high occurrence potential lands for oil and gas within the Steese, Upper Black River, and White Mountains subunits, cumulative impacts would be minimal as this plan does not anticipate leasing. If future leasing were to occur, the cumulative impact to the resource would be the removal of natural gas or oil by producing wells on leases with the fewest restrictions and lowest operating costs. The production of natural gas and oil is a beneficial irretrievable commitment of the resource. Production of these resources in a specific reservoir would not affect natural gas or oil recovery from a separate reservoir.

Cumulative impacts to the oil and gas resource would be greatest under Alternatives C and D, if leasing were to occur. No leasing would occur in Alternative A. There would be no interest in leasing under Alternative B since most high occurrence potential lands would be closed.

Restrictions on federal leases could impact the leasing and development of adjacent non-federal leasable minerals. If an exploration company could not put a block of leases together, because of restrictions on federal leasable minerals, the private or state minerals may not be leased or developed either. Leasing of federal minerals on the other hand, could encourage the leasing of private or state minerals. Fluid leasable minerals are not expected to be impacted by the extraction of other minerals over the life of the plan.

Decisions and restrictions on fluid mineral leasing proposed in this RMP, combined with restrictions on mineral leasing on other lands in the planning area, would have a minor incremental effect by limiting the timing and locations available for oil and gas development. The BLM high potential occurrence lands are on the periphery of the Yukon Flats Oil and Gas Basin. Most of the basin is located on private and federal lands in the Yukon Flats NWR (Map 96). Without exploration and discovery on these private and other federal lands, little interest would be expected on BLM lands.

The incremental effect would be the greatest under Alternative A, where all of the BLM lands (6,733,000 acres or twenty-two percent of all lands in the planning area), would be closed to fluid mineral leasing. Incremental effects would be lower under Alternatives B and C, where 5,714,000 to 3,241,000 acres of the BLM lands (eighteen and eleven percent of the total lands in the planning area) respectively, would be closed to fluid mineral leasing. Under Alternative D, the incremental effect would be the lowest with only 1,310,000 acres of BLM lands (four percent of the total lands in the planning area) closed to leasing and an even higher percentage of the high occurrence potential lands open.

4.3.2.4. Solid Leasable Minerals

Summary of Effects

Although decisions in Alternatives B, C, and D propose to open from 976,000 acres to 1,918,000 acres in the planning area to solid mineral leasing, these decisions would have no effect due to the lack of these resources on BLM lands and a decision to defer coal leasing.

4.3.2.4.1. Effects Common to All Alternatives

All unleased BLM-managed lands (including selected lands) within the planning area, subject to leasing under 43 CFR 3400.2, would be open for coal exploration and non-energy leasable mineral prospecting (oil shale, potassium, sodium, phosphate, and gilsonite). Exploration of federal coal would be considered if an application were received. There are no known occurrences of non-energy leasables of commercial quantity on BLM lands, thus no exploration or development is anticipated.

Although decisions in Alternatives B, C, and D propose to open from 976,000 acres to 1,918,000 acres to non-energy solid mineral leasing, these decisions would have no effect due to the lack of these resources on BLM lands.

There are known coal occurrences in the planning area (Map 96). The Eagle Field (Fortymile Subunit) at 392,500 acres is the largest. The Eagle Field does not contain high quality coal (lignite to subbituminous C, 0.2 to 0.6 sulfur, and two to twenty percent ash) and it has an estimated recoverable resource of 10 million short tons. There is very little interest associated with coal occurrences in the Fortymile Subunit unless nearby infrastructure were present or demand increased. The town of Eagle is 15 miles southeast of the Eagle Field. The Circle and Steese Coal Districts are within the Steese Subunit. The Circle District is almost entirely on state land near the town of Central. The Steese District is located in the Steese NCA and Yukon Flats NWR. Development potential for the Steese District is greatly limited by its remote location and small resource body. Neither of these coal districts are considered valuable to industry at this time.

In the unlikely event interest was shown in the Steese District or Eagle Field, the resource would be unavailable due to existing withdrawals under Alternative A and a decision to defer coal leasing under Alternatives B, C, and D. If a company expressed interest in coal leasing, the coal screening process would be completed. If the screening process found the lands appropriate for coal leasing, the RMP would need to be amended before leasing could occur, delaying any potential development. Unless infrastructure were improved, or the demand for coal increased to a point where a low quality resource was desirable, the coal resource would remain in the ground.

4.3.2.4.2. Cumulative Effects

There would be no cumulative impacts under any alternative as there are no likely coal or other non-energy deposits attractive to industry. If a solid mineral resource were developed on adjacent, non-BLM lands, interest in BLM lands could be rejuvenated. Exploration could be conducted on BLM lands, but leasing would require a nomination of specific lands and a plan amendment.

4.3.2.5. Salable Minerals

Summary of Effects

There would be no effects under Alternative A. Effects would occur under Alternatives B, C, and D as some lands would be closed to salable minerals. The unavailability of salable minerals could make projects more logistically challenging or uneconomic. This effect would be minor as

demand for salable minerals on BLM lands would be low or nonexistent due to the remote nature of the closed areas and the lack of infrastructure.

4.3.2.5.1. Effects Common to All Alternatives

A NEPA review would be required for all salable mineral extraction operations on BLM lands. Section 106 of the National Historic Preservation Act requires a cultural resource evaluation to be conducted and resources located prior to allowing any surface disturbance. Reclamation would be required. Under interim management guidelines, mineral material sales and free-use permits would not be conducted on selected lands without written consent of the potential future land owner. Material sales and permits are not issued on un-certificated Native allotments. Monies collected from sales and permits on selected lands are put into escrow for the future land owner.

Demand for mineral materials are driven by development projects. If other decisions in the plan constrain construction of facilities, trails, or roads, there would be less need for salable minerals. In areas where sand and gravel is needed for development, but which are closed to salable minerals, the sand and gravel would need to be brought in from another area, most likely at a higher cost. In some cases, this could make the project uneconomical.

4.3.2.5.2. Alternative A (No Action)

Development of mineral materials sites would not be constrained under Alternative A, except as restricted by interim management guidelines for selected lands. No unencumbered federal lands would be closed to mineral material sales and permits.

4.3.2.5.3. Alternative B

Under Alternative B, 3,933,000 acres (fifty-nine percent of the planning area) would be open to salable minerals. There would be no effects in these open areas.

Approximately 2,740,000 acres (forty-one percent of the planning area) would be closed to salable minerals. Closed areas would include the “wild” and “scenic” segments of the Fortymile WSR Corridor, the Steese SRMA, the Salmon Fork ACEC, and portions of the White Mountains NRA. The unavailability of salable minerals can make projects logistically challenging or uneconomic as companies would be forced to look elsewhere for a readily available product. If a need for sand or gravel were identified in a closed area, the resource would not be available from BLM lands. The effects of these closures would be minor as most of the closed areas are remote and would be managed to maintain a Primitive or Semi-Primitive recreation setting. Little demand for mineral materials would be anticipated in the closed areas.

4.3.2.5.4. Alternative C

Under Alternative C, 6,346,000 acres (ninety-four percent of the planning area) would be open to salable minerals. There would be no effect in these open areas.

Approximately 387,000 acres (six percent of the planning area) would be closed to salable minerals. Closed areas would include the “wild” and “scenic” segments of the Fortymile WSR Corridor, and the Birch Creek and Beaver Creek WSR Corridors. These closures would not pose an adverse affect to salable minerals as there are few developed trails within the WSR corridors

and no demand for mineral materials would be anticipated. Some of the “scenic” segments of the Fortymile WSR are adjacent to the Taylor Highway. Closures in these areas could make highway maintenance projects more costly.

4.3.2.5.5. Alternative D

Under Alternative D, 6,588,000 acres (ninety-eight percent of the planning area) would be open to salable minerals. There would be no effects in these open areas.

The “wild” segments of the Fortymile WSR would be closed to salable minerals. This closure would not pose an adverse affect to salable minerals as this area is remote and no demand for mineral materials would be anticipated.

4.3.2.5.6. Cumulative Effects

Decisions in this plan, combined with restrictions on salable minerals on state land would have a minor incremental effect by restricting the locations available for salable minerals. Approximately fifty-nine, twenty, and twenty-six percent of the Fortymile, Steese and White Mountains subunits, respectively, are state land. The state lands are open to salable minerals, and are adjacent to the Alaska Highway System and the TAPs, where the most demand for mineral materials is anticipated. Additionally, there are existing BLM material sites along the highways that would remain available under all alternatives. There would be no incremental impacts under Alternative A in any subunit as all BLM lands would be open to mineral material sales.

Under Alternative B, the incremental effect of closing 2,119,000 acres to salable minerals in the Fortymile, Steese and White Mountains subunits would be minimal. Closing 621,000 acres in the Upper Black River Subunit would have no incremental effect as there are no roads or other infrastructure within the subunit.

Under Alternative C, the cumulative effect of closing 387,000 acres to salable minerals in the Fortymile, Steese, and White Mountains Subunit would be less than Alternative B. These closed areas represent only one percent of all lands within the planning area and six percent of the BLM lands.

The cumulative effects would be even lower in Alternative D. Only 145,000 acres in the Fortymile Subunit would be closed. This closed area is remote from the highway system and represents only two percent of the BLM lands and less than one percent of all lands in the planning area.

4.3.2.6. Recreation

Summary of Effects

Measures to protect natural resources would generally benefit recreation by enhancing scenic quality and opportunities for fish- and wildlife-related recreation. The protection and interpretation of cultural sites would provide beneficial experiences for those seeking historical and cultural appreciation opportunities. Negative effects may occur due to restrictions on trail, site, or facility development to avoid sensitive areas or to prevent resource degradation. These effects would not vary greatly by alternative or subunit.

4.3.2.6.1. Effects Common to All Alternatives

Effects from Air and Atmospheric Values

The effects of smoke, haze, or other air pollutants would result in immediate and direct effects to recreational activities that include scenic qualities as part of the experience. For all of the alternatives, emission-generating activity decisions will comply with federal and state air quality standards, and will be managed to consider the effects of smoke (from wildland fire and prescribed burns) to recreation and tourism. These decisions would have long-term, beneficial impacts on all recreational opportunities, as air quality would be protected to provide quality scenic experiences.

Effects from Cultural and Paleontological Resources

Under all alternatives, site-specific measures regarding cultural and paleontological resources would preserve and protect these resources and ensure that they are available for appropriate uses by present and future recreation users. The protection and possible interpretation of these resources would provide beneficial experiences for those individuals seeking historical and cultural appreciation opportunities. Negative effects of cultural and paleontological resources involve the possible restriction of trail, site, and facility development in areas that conflict with existing cultural sites. Short-term impacts of excavation and long-term impacts from the possible destruction of cultural sites could further impact recreation users, through the removal of valuable appreciation opportunities.

Effects from Fish and Aquatic Species

Measures to protect and/or restore healthy, functioning watersheds, riparian areas, and aquatic habitats, would result in long-term, beneficial impacts to fisheries related recreation activities and experiences. For all alternatives, fish management decisions would strive to maintain or restore the quality of water and aquatic ecosystems, resulting in improved fisheries related recreation. Negative effects of fisheries management on recreation involve the possible restriction of trail, site, and facility development in Riparian Conservation Areas or Essential Fish Habitat.

Effects from Non-Native Invasive Species and Vegetative Communities

Proper vegetative management practices, combined with a preventative approach to the introduction and spread of non-native invasive species, would provide a productive wildlife habitat for recreational use. Under all of the alternatives, integrated pest management (IPM) practices would be used to control or eradicate non-native invasive species, to improve vegetative communities and improve or restore ecosystem health. These management decisions would also provide for long-term, beneficial impacts to all recreational users in areas where vegetative communities provide scenic viewsheds that enhance the quality of recreational experiences. Negative effects of vegetation management on recreation involve the possible restriction or modification of trail, site, and facility development. Certain recreational areas or activities could be closed (seasonally or permanently) due to higher potentials of vegetative damage or susceptibility to invasion by non-native invasive species.

Effects from Soil and Water Resources

Under all alternatives, measures would be enacted to ensure that watersheds are in, or making significant progress toward, a properly functioning condition. Soils would be managed to reduce erosion and minimize impacts to soil profiles, while water would be managed to comply with

State of Alaska water quality requirements. These management decisions could directly affect recreation management if restrictions are implemented to protect soils or water quality in areas that are used for activities such as OHV use, fishing, and boating. Other activities such as hiking and wildlife viewing would be indirectly affected as the health of watersheds improve.

Effects from Special Status Species

Measures to protect and preserve Special Status Species would result in immediate and direct effects to all recreational activities that impact these species. Under all alternatives, recreational uses in areas containing sensitive, threatened, or endangered species could be restricted, relocated, or excluded to avoid further resource damage. Impacts to recreation may be short-term or the life of the plan dependent on the management decision. Long-term benefits from management for Special Status Species include enhance recreational botany and wildlife viewing , thus increasing natural appeal.

Effects from Wildland Fire Ecology and Management

As an essential ecological process and natural agent of change, wildland fires promote vegetative and wildlife diversity that can result in long-term, direct effects to recreation opportunities. New vegetative growth and improved wildlife habitat can result in increased wildlife numbers that have beneficial impacts on wildlife viewing and hunting. Negative effects of wildland fire on recreation are typically short-term, and are directly related to the effects of fire on resources used in recreation, such as recreation facilities, and on recreational scenic quality until vegetation can re-grow and return to a more esthetic state.

Effects from Wildlife

Management of a naturally functioning ecosystem to support healthy populations of wildlife would directly and indirectly protect recreation resources. Healthy wildlife populations would benefit hunting, wildlife viewing, and trapping activities. Negative effects of wildlife on recreation may occur if restrictions are placed on trails and facility development in order to avoid conflicts with priority wildlife habitats.

Effects from Recreation

Under all alternatives, lands not identified as a Special Recreation Management Area (SRMA) would be managed to provide for custodial actions only, through minimal facilities, structures, and regulations, except when deemed necessary to address visitor health and safety, user conflicts, and resource protection issues. Together, these actions would directly affect recreation management by ensuring that land-and water-based recreation opportunities continue to exist throughout the planning area.

Effects from Hazardous Materials

Environmental remediation activities would enhance recreation resources directly and indirectly by removing contaminated and hazardous materials, resulting in a more natural landscape and safer environment. The size and scope of the impacts would depend on the size of the site and the techniques used for removal and remediation activities.

Effects from Subsistence

Proper subsistence management practices, combined with a proactive approach to the protection and maintenance of sufficient wildlife habitat, will provide for healthy populations of subsistence species (such as moose and caribou), sufficient to provide opportunity for recreational use while still meeting subsistence needs. Under all alternatives, measures that serve to minimize impacts to subsistence uses, users and/or resources, would provide long-term, direct benefits to fish and game related recreation activities. However, if subsistence resources become limited, recreational uses of fish and game may be reduced.

4.3.2.6.2. Cumulative Effects

Management actions described under the RMP will maintain the recreation spectrum for the planning area for the life of the plan. Outside factors not controlled by the plan may impact recreation common to all units.

An increase in population in Interior Alaska will likely cause use number to increase over the life the plan; however management for the Recreational Opportunity Spectrum and the use of indicators should prevent negative impacts. Increases in tourism in Interior Alaska may also show an increase in use numbers although the same strategy as described above would be employed. Improved transportation corridors may enhance visitor access to recreation areas and facilities. Enhancements, developments or closing of other federal and state recreation areas will also impact use numbers. These changes cannot be predicted, but can be monitored.

Climate change would have an effect on recreation, but how and to what extent is unknown. Warmer and drier conditions are expected along with an increased potential for wildland fire, leading to a vegetative shift towards a greater deciduous dominance on the landscape (Rupp and Springsteen, 2009b). Warmer drier conditions could result in changes to the traditional seasonal uses of recreation users. Winter activity use periods may increase or decrease, as temperatures and precipitation fluctuate. Summer type activities may benefit with predicted drying trends producing better hiking and OHV opportunities. On the other hand, floating use may become more challenging if adequate precipitation and run-off does not occur.

4.3.2.7. Travel Management

Summary of Effects

Measures to protect natural and cultural resources (such as fish, wildlife, soils, water quality, cultural sites) may reduce opportunities for travel-related activities. Trails may be rerouted to avoid sensitive sites or emergency closures may be implemented. These decisions would result in negative impacts to travel opportunities by limiting the accessibility and availability of public lands and features, including roads, primitive roads, and trails. Activities that result in development of new access may increase opportunities for travel-related activities.

4.3.2.7.1. Effects Common to All Alternatives

Effects from Air and Atmospheric Values

Snowmobile use would most likely emit the most concentrated emissions output within the White Mountains NRA. Emissions would be concentrated mainly at the trailheads, and then would disperse. Studies in Yellowstone National Park found that use levels of up to 318 (Best Available Technology) snowmobiles per day and up to 78 snow coaches per day would only have

negligible impacts on air quality and would allow for maintenance of air quality at acceptable levels (NPS 2009). Snowmobile use has not exceeded this level in any subunit and is unlikely to do so during the life of the plan under any of the alternatives. Current trends in automobile and OHV technology are towards reducing emissions. It is foreseeable that air quality issues would not impact travel management decisions.

Effects from Cultural and Paleontological Resources

Under all alternatives, site-specific measures regarding cultural and paleontological resources would affect transportation management if restrictions or emergency closures were implemented, to protect and preserve significant cultural resources. These site-avoidance decisions would result in long-term, negative impacts to travel opportunities by limiting the accessibility and availability of public lands and features, including roads, primitive roads, and trails. If it is determined that OHV use or trail construction could negatively impact cultural or paleontological resources, the use may be deemed inappropriate or trails may be relocated to avoid negative effects.

Effects from Fish and Aquatic Species

Measures to mitigate the impacts of development on the fishery resource are attached as stipulations to the authorizing documents. Special stipulations are placed on development activities in crucial habitat areas such as fish spawning and over wintering areas. All surface-disturbing activities are required to use the best available technology to reduce siltation and stream turbidity to an acceptable level for fish survival and reproduction. All surface-disturbing activities are required to minimize future erosion. Effects on travel from fish management might include rerouting trails to avoid crucial habitat areas or potential trail closures. Strict adherence to best management practices or avoidance of crucial habitat areas will minimize impacts to travel management.

Effects from Invasive Species

Vegetation and surface-disturbing changes would result from all the alternatives in this Draft RMP/EIS. These disturbances all increase the risk of propagation of exotic, invasive or noxious non-native plants, and more so in Alternatives A and D since cross-country travel would be allowed. In Alternatives B and C, use would be more controlled and spread of invasive species could be reduced because OHV use would be more restricted in acreage and miles. Effective implementation of management decisions for non-native invasive species would keep the risk from becoming greater than at present and help reduce risk in the future. If some areas become impacted, avoidance areas may have to be delineated to reduce the spread of invasive species and potentially some areas could be temporarily closed to OHV use until the impact is mitigated.

Effects from Soil Resources

Managing soil resources will affect travel management if the proliferation of user-created trails, that are unsustainable from a resource management perspective, continue to evolve in unsuitable locations throughout the planning area. Increased erosion and melting permafrost, due to surface-disturbing activities, would continue to occur in portions of the planning area, where summer-motorized travel is allowed. This could affect travel management if restrictions or emergency closures became necessary, to mitigate soil erosion or minimize effects on soil profiles.

Effects from Special Status Species

Travel can be impacted through specific limits on OHV use or trail development within areas that contain Special Status Species. Proposed or permitted uses such as trail construction or designation would be analyzed and measures enacted to minimize impacts to these species. If it is determined that OHV use or trail construction may negatively affect a Special Status Species, the use may be limited to seasons when the species is not present, or the type of use or trail relocated to areas where the species is unlikely to be encountered.

Effects from Vegetative Communities

Measures to protect and/or restore healthy functioning watersheds, riparian areas, and associated vegetative communities could directly affect travel management if routes or areas were restricted or closed, to protect sensitive resource species. Effects would be short- or long-term, depending on the duration of the restrictions or closures, and could result in an overall net decrease of acres available for OHV use.

Effects from Visual Resources

VRM generally benefits travel management by helping to maintain scenic character within an area designation. VRM decisions would have long-term, beneficial impacts on travel activities that include scenic qualities as part of the experience. Minor effects may result if restrictions are placed on travel or OHV use, in areas that possess increasing recreation demands.

Managing visual resources may impact the design and layout of transportation facilities depending on the VRM Class. Areas assigned VRM Class I allow very limited management activities. The level of change to the characteristic landscape should be very low and must not attract attention of a casual observer. This objective will allow for transportation facilities that do not attract attention.

VRM Class II objective is to retain the existing character of the landscape where the level of change to the characteristic landscape should be low and management activities may be seen, but should not attract the attention of the casual observer. This will allow for some transportation facilities development that do not attract attention.

VRM Class III objective is to partially retain the existing character of the landscape where the level of change to the characteristic landscape can be moderate. Management activities may attract attention, but should not dominate the view of the casual observer. This will allow for some transportation facilities development that may attract attention.

VRM Class IV objective is to allow for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. This will allow for transportation facilities development that may dominate the landscape.

Effects from Water Resources

Managing watersheds to ensure that they are in, or making significant progress towards, a properly functioning physical condition could affect travel management if restrictions or emergency closures were enacted, to mitigate impacts on water resources. Routes that cross streams or contribute to non-point pollution, supporting the impairment of the hydrologic regime (such as ground water, streamflow, water quality, biologic integrity, or riparian connectivity), would be temporarily or permanently closed to the type of use causing the effect.

Effects from Wildland Fire Ecology and Management

Existing and future structures and facilities will be prioritized for protection. Construction of fire lines if not rehabilitated may create new trails that would be available for OHV users. Travel and OHV use would likely not be interrupted due to wildland fire management activities except on a short-term, temporary basis. In forested areas, falling trees may affect trail travel after a fire occurs. It is anticipated that there would be little impact to travel management and OHV from wildland fire management.

Effects from Salable Minerals

Disposal of sand, gravel, rock, and other salable minerals must be compatible with the management of the subunit as designated. It is most likely that gravel sales on BLM lands would occur for BLM projects such as trails and roads. Mineral material sales could help facilitate development or improvement of trails as a source of materials close to the project site. Material sales could increase the opportunities available for OHVs by constructing gravel pits and access roads.

Effects from Subsistence

Federally qualified subsistence users would continue to have reasonable access to subsistence resources on all public lands within the planning area. In areas with either yearlong or seasonal restrictions on OHV use, subsistence access could be allowed by permit. If the number of federally qualified subsistence users becomes too large in any given area, impacts from this use could result in trail or area closures and impacts other users.

4.3.2.7.2. Cumulative Effects

Management actions described under the RMP and subsequent Travel Management plans developed for each unit will maintain travel access. Improved transportation corridors in all alternatives on BLM-managed lands will lead to long-term increased use due to the size and scale of remote lands not managed by BLM by adjacent to the planning area.

Under Alternatives B-D, motorboat use will be permitted per ANILCA 1110(a) on all rivers including non-navigable “wild” segments of designated WSRs. The No Action Alternative does not allow use of motorboats on non-navigable “wild” segments with the exception of subsistence users. There is no baseline data for comparison of impacts; however an increase in use is expected would be expected with increased access. Conflicts in non-motorized and motorized users could arise if a substantial number of motorized users increase. Improvements in road access or other boat launch locations on non BLM managed lands may increase motorized users. There is one such launch planned in the Steese subunit, but no indications of other launches or improvements in the remaining subunits at this time.

Proposed language changes in the action alternatives from GVWR to curb weight for OHVs will reduce confusion for users and will be similar to the State of Alaska regulatory language for OHV use. This will increase compliance on trails and reduce impact of resources.

Outside factors may impact travel management. An increase in population in Interior Alaska will likely cause use number to increase over the life the plan; however management for the Recreational Opportunity Spectrum and the use of indicators should prevent negative impacts. Increases in tourism in Interior Alaska may also show an increase in use numbers although the same strategy as described above would be employed. Improved highway transportation corridors on non BLM managed lands may enhance access and thus increase use pressure. Enhancements,

developments or closing of other federal and state recreation areas will also impact use numbers. These changes cannot be predicted, but can be monitored. Most impacts are likely in Frontcountry and Middlecountry zones. Advancements in technology related to ATVs, UTVs, motorboats may increase ability to reach more remote lands; however the use of the Recreational Opportunity Spectrum and the size, scale and scope of the landscape will be limiting factors.

Climate change would have an effect on Travel Management, but how and to what extent is unknown. The trends of climate change show warmer temperatures, more wildland fire activity, change in vegetation from a boreal dominated forest to a deciduous dominated forest (Rupp and Springsteen, 2009b). Trends also predict more precipitation in the form of rain and snow, but generally drier conditions due to warmer temps and changes in vegetation. Travel management would have to adapt as conditions change. Some areas may become less suitable for trail routes while other areas may become more suitable. Temperature change predictions over the next 20 years indicate a minimal increase, thus effects to Travel Management are expected to be negligible.

4.3.3. Social and Economic Conditions

4.3.3.1. Economics

Summary of Effects

The economic effects from Forest Products, Leasable Minerals, Renewable Energy, Lands and Realty, and Recreation would be low. Recreation use is expected to grow slowly with increased population in the region. Economic effects would be low for all alternatives, but slightly higher in Alternative D than in Alternatives A, B, and C.

Non-market and Non-use values would be highest in Alternative A, as ANCSA 17(d)(1) withdrawals prevent most development. Under Alternatives B, C, and D, these values would decrease in proportion to acreage protected through mineral withdrawal, Primitive or Semi-Primitive recreational settings, maintenance of wilderness characteristics or special designations.

The largest economic effect would be from fluid leasable (oil and gas) and locatable minerals. The effects of these programs are discussed under the subunit specific impact analyses later in this Chapter.

4.3.3.1.1. Effects Common to All Alternatives

The following resources, resource uses, and programs would have no economic effects and are not analyzed further: Air and Atmospheric Values, Cave and Karst Resources, Cultural and Paleontological Resources, Fish and Aquatic Species, Soil Resources, Special Status Species, Vegetative Communities, Visual Resources, Water Resources, Wildland Fire, Wildlife, Salable Minerals, and Hazmat.

Anticipated levels of BLM Resource Management

The BLM predicts that monitoring and oversight activities would increase in all subunits under the action alternatives. These increases would be similar for all subunits and all would be relatively small. There would be no increase in activities in any subunit under Alternative A. While there would be no economic effect resulting from Alternative A, effects under all other

alternatives would be similar. There would be a small increase in spending in procurement of aircraft and other transportation. These increases would be expected to apply primarily to Fairbanks and Tok, where most air taxi services are based.

Effects from Forest and Woodland Products

Due to the inaccessibility and lack of valuable timber, a large commercial timber sale would be unlikely to occur during the life of the plan. The BLM may receive applications for small biomass projects. However, given the inaccessibility and distance of BLM lands from local communities, demand for these types of projects is expected to be low. Forest product sales would be small and the level similar to that which has occurred over the past 20 to 30 years. Authorized use of forest products in the planning area over the last 10 years has totaled three free-use permits and one small vegetative sale contract for the entire period. While there would be no economic effect resulting from forest products under the Alternative A, effects under all other alternatives would be similar and very low.

Effects from Leasable Minerals

No exploration or development for coal, coalbed natural gas, geothermal, non-energy leasable minerals, or oil shale is anticipated on BLM lands during the life of the plan. A decision on leasing for coal is deferred. The only hot springs on BLM land is Big Windy Hot Springs, which is a RNA and is not located near a population center or infrastructure. There is no occurrence of oil shale on BLM lands and potential for other leasable minerals is very low.

Coal, geothermal, coal bed natural gas, non-energy leasable minerals, and oil shale related activities would not occur and would not contribute to economic effects.

Effects from Renewable Energy

Considering such factors as the amount and intensity of sunlight, wind velocity, proximity to roads and electric transmission facilities, and population size, no applications would be received to permit commercial construction of solar or wind facilities on BLM-managed lands. The BLM could construct small solar or wind facilities to support BLM administrative sites or campgrounds. The economic effect under all alternatives would be negligible.

Effects from Lands and Realty

There would be continued demand for rights-of-way and various types of leases and permits. The demand for these land use authorizations would fluctuate with the degree of economic growth and development occurring within the region, but would generally remain minimal. Based on applications over the past five years, it is anticipated that no more than 30 applications would be received annually. Economic effects, if any, would be analyzed in future site-specific NEPA analyses required for land use authorizations.

Non-Market and Non-use Values

Natural amenities and the quality of life are recognized as economic factors of some rural communities in the American West and elsewhere (Rudzitis and Johnson 2000). While these factors do not directly generate income as do mining, tourism charters, or logging, they do attract residents, recreationists, and may attract new businesses. Open spaces, scenery, and protected lands are important to residents and recreationists in the west for example. These values are thought to contribute to healthy economies and lifestyles (Rasker et al., 2004). The relationships

are difficult to qualify, as it is difficult to assess or quantify effects of management on economic activities. Non-market values have been best quantified for subsistence activities in Alaska (Colt 2001).

Non-use values represent the value assigned to a resource by individuals, independent of the use of the resource. These represent the value that individuals obtain from knowing that the resource exists and will be available to future generations. Wilderness has been the subject of numerous non-use studies, and willingness-to-pay estimates for protection or designation identified a range of values (Krieger 2001, Loomis and Richardson 2001).

Non-market and non-use values would be preserved through a variety of RMP decisions, several of which may apply to the same piece of ground. Decisions that would generally help preserve non-market and non-use values include withdrawal from locatable mineral entry, closure or no surface occupancy for leasable minerals, special designations, maintenance of wilderness characteristics, Primitive or Semi-Primitive recreational settings, and visual resource management. Non-market and non-use values would decrease in proportion to acreage protected under each alternative.

4.3.3.1.2. Alternative A

Effects from Recreation

Under Alternative A, commercial outfitting or guiding permits issued by the BLM are relatively low in all subunits. Recreation use is expected to grow slowly with increased population in the region. Economic effects would be correspondingly low. Effects would be somewhat higher in the White Mountains subunit compared to other subunits, due to its proximity to Fairbanks and the focus on recreation oriented activities in the White Mountains NRA.

Non-Market and Non-Use Values

Non-market and non-use values would be the highest in Alternative A, as ANCSA 17(d)(1) withdrawals prevent development on more than six million acres. Existing special designations including the Steese NCA, White Mountains NRA, RNAs, and three Wild and Scenic Rivers would also help preserve non-market and non-use values.

4.3.3.1.3. Alternative B

Effects from Recreation

Same as Alternative A.

Non-Market and Non-Use Values

Non-market and non-use values would be somewhat lower in Alternative B than under Alternative A, as 1,021,000 acres would be opened to mineral location and solid mineral leasing in the Fortymile and Steese subunits. New locatable mineral activity is likely in these subunits and non-market and non-use values would be affected. However, eighty-five percent of the planning area would remain closed to mining activity, 2,869,000 acres would be designated as ACECs, and wilderness characteristics would be maintained on 5,059,000 acres. Five rivers would be recommended suitable for designation under the Wild and Scenic Rivers Act. All existing special designations would be retained.

Non-market and non-use values in the Upper Black River Subunit could be enhanced under this alternative due to the designation of the Salmon Fork ACEC and recommendation of the Salmon Fork as suitable for designation as a Wild and Scenic River.

Non-market and non-use values in the White Mountains Subunit would essentially remain the same as Alternative A.

4.3.3.1.4. Alternative C

Effects from Recreation

Same as Alternative A.

Non-Market and Non-Use Values

Non-market and non-use values would be lower in Alternative C than under Alternative B, as 4,114,000 acres would be opened to mineral location and solid mineral leasing in the Fortymile, Steese, and Upper Black River subunits. New locatable mineral activity is likely in the Fortymile and Steese subunits and non-market and non-use values would be affected. Only 1,628,000 acres would be designated as ACECs, and wilderness characteristics would be maintained on 2,067,000 acres. No new rivers would be recommended as suitable for designation under the Wild and Scenic Rivers Act. However, all existing special designations would be retained.

Although, the Upper Black River Subunit would be opened to locatable minerals, no mining activity is anticipated due to the lack of mineral potential. If exploration or development did occur, it would likely only affect small areas within the subunit. Thus non-market and non-use values would generally remain on most of the subunit.

Non-market and non-use values in the White Mountains Subunit would be the same as Alternative B.

4.3.3.1.5. Alternative D

Effects from Recreation

Commercial outfitting or guiding permits issued by the BLM would increase slightly over Alternatives A, B, and C. Possible economic effects would include additional seasonal jobs, increased air charter service use, and income from guiding and outfitting for recreationists. These effects would be low.

Non-Market and Non-use Values

Non-market and Non-use values would be lower in Alternative D than under Alternative C as 4,985,000 acres would be opened mineral location and solid mineral leasing in the Fortymile, Steese, and Upper Black River subunits. Additionally, 5,423,000 acres would be opened to mineral leasing in all four subunits. Only 1,360,000 acres would be designated as ACECs and wilderness characteristics would be maintained on 535,000 acres. All existing special designations would be retained.

Although, all of the Upper Black River Subunit would be opened to locatable minerals, no mining activity is anticipated due to the lack of mineral potential. If exploration or development did

occur, it would likely only affect small areas within the subunit. Thus non-market and non-use values would generally remain on most of the subunit.

Non-market and non-use values in the White Mountains Subunit could be lower than in Alternative C. Approximately 451,000 acres in the White Mountains NRA would be available for solid mineral leasing. No exploration or leasing is anticipated during the life of the plan, but if it occurred, non-use and non-market values would be reduced in the vicinity of the activity.

4.3.3.1.6. Cumulative Effects

Alternative A

Cumulative Effects to economics would be low if current management is continued under Alternative A. The ANCSA 17(d)(1) withdrawals prohibiting mineral development would remain in place, allowing for very little new economic activity in the planning area. Current regional employment and income from mining would continue to provide economic benefits for residents in the planning area. Currently, less than two percent of statewide and non-resident mining employment results from activities on BLM-administered mining claims.

Recreation activities are expected grow with population, and jobs could be created. Under Alternative A, no new guiding would result.

Current Regional Employment and Income from Mining

Pogo Mine, located near Delta Junction, and Fort Knox Mine, north of Fairbanks, are the largest gold producers in Alaska. Fort Knox (Fairbanks Gold Mining Inc.) employs 400-425 people at the mine and mill, operating on two shifts, 24 hours per day, 365 days per year. In 2010, the Pogo Mine workforce was approximately 300 employees (Szumigala et al., 2011). These mines are expected to continue operation during the life of the RMP.

Mining companies are the largest taxpayers in Fairbanks North Star Borough. Fort Knox paid \$2.8 million in property taxes to the Fairbanks North Star Borough in 2008. Payment in lieu of taxes or similar payments to communities provide additional economic benefits. The city of Delta Junction received \$500,000 from Pogo in 2008.

New Projects

Oil and gas projects in the planning stage or affecting the region include pipelines and oil and gas production. A natural gas pipeline carrying product from the North Slope has been under consideration since the 1970s. Doyon, Limited, is currently considering exploration of oil and gas resources on Native owned land in the Yukon Flats basin northeast of Fairbanks. Gold mining activity north of Fairbanks may increase with development of prospects near Livengood, owned by International Tower Hill Mines, Ltd. True North Mine, owned by the Fairbanks Mining Company, is another prospective mine within 25 miles of Fairbanks. Any of these projects would contribute to economic benefits in the region, particularly in the Fairbanks area. These projects involve private land within the planning area.

Alternatives B, C, and D

Cumulative Effects to economics are similar for Alternatives B, C, and D. Although the net effect would differ slightly between alternatives, the marginal addition to employment and income would be similar.

Recreation activities are expected grow with population, and new jobs could result from additional guiding activities. These effects would vary slightly between subunits. However, the total effect to economics would be marginal and low.

Oil and Gas potential exists in three subunits and is assumed to result in exploration only in the Upper Black River and Steese subunits. Exploration would have economic consequences additive to the current condition. However, as discussed in section 4.5.4.1 Effects Specific to the Steese Subunit, effects to employment and income would be very low. This is due to the limited effort predicted on BLM-managed lands (e.g., only 20 miles of seismic lines). Seismic exploration on BLM-managed lands in either subunit, would likely only result if Doyon, Limited, conducted exploration on private lands in the Yukon Flats basin. The primary economic effects would result from Doyon, Limited, exploration and it would be difficult to isolate jobs and income resulting from the extension of exploration activities onto BLM-managed lands. Due to low level of exploration anticipated on BLM-managed lands, the additive economic affects would be marginal and very low.

The Alaska Miners Association attributes 3,500 direct jobs, and 5,500 total direct and indirect jobs to all mining in the state of Alaska (McDowell 2006). Cumulative effects resulting from mining on BLM-managed lands in any subunit would result from placer type mining at scales far smaller than existing mining or proposed projects in the region. Table 4.10, “Direct Employment and Income” shows resulting employment in new gold mining. The cumulative effect to mining industry employment would be less than two percent for any alternative. The Alaska Division of Geological and Geophysical Services (DGGS) reports 282 placer gold mining jobs in the state (Szumigala et al., 2009).

4.3.3.2. Environmental Justice

Summary of Effects

This section discusses programs, activities, and resources that will be little affected by planning decisions. In these cases, effects on environmental justice populations are negligible.

The following programs would have no economic effects and are not analyzed any further: Air, Cave and Karst Resources, Cultural and Paleontological Resources, Fish and Aquatic Species, Soil Resources, Special Status Species, Vegetative Communities, Visual Resources, Water Resources, Wildland Fire Ecology and Management, Wildlife, Salable Minerals, and Hazmat.

4.3.3.2.1. Effects Common to All Alternatives

In twelve communities within the planning area, minorities make up forty-seven (Tetlin) to one-hundred percent (Birch Creek) of the population...primarily Alaska Natives. Minority populations are highest in the Black River and Fortymile subunits. These communities have significantly subsistence oriented economies characterized by high unemployment, low labor force participation, and relatively low income, and where energy and retail goods are expensive. Activities restricting subsistence practices, access, and resources may affect a segment of the local population.

Activities likely to occur in the planning area, other than those associated with mineral extraction or oil and gas, would primarily be transitory in nature, of short duration, and highly localized. Under all alternatives, the effects of recreation and forestry would be similar. Activities could

temporarily divert, deflect, or disturb subsistence species from their normal patterns. These activities could alter the availability of subsistence species in traditional harvest areas, which could in turn affect harvest patterns by requiring hunters to travel further in pursuit of resources. Increased travel distances would result in greater expenditures for fuel and equipment, and increased wear and tear on equipment. There could be an effect on the subsistence hunting activities of local minority populations as a result of these activities. The effects would likely be minor, short-term, and highly localized.

Effects to subsistence and wildlife are addressed in greater detail in sections 4.3.3.4., and 4.3.1.12.

4.3.3.2.2. Cumulative Effects

Cumulative Effects to environmental justice populations from BLM decisions would be low if current management is continued under the No Action Alternative (Alternative A). Effects of additional recreation resulting from population growth would be low.

Withdrawals prohibiting mineral development would remain in place allowing for very little new economic activity. Current regional employment and income from mining would continue to provide economic benefits for residents in the planning area. For more detail, see section 4.4.4.1 Economics, analyzing current regional employment and income from mining, for description of existing mines and possible new developments on private land.

Cumulative Effects to environmental justice populations are similar under Alternatives B, C, and D. Recreation activities are expected grow with population, and new jobs could result from additional guiding activities as described in section 4.3.3.1 Economics. These effects would vary slightly under the alternatives in each subunit. However, the total effect to would be low.

Exploration for oil and gas could occur on high potential lands in the Upper Black River and Steese subunits. Exploration would have economic consequences additive to the current condition. However, effects to employment and income would be very low due to the limited exploration predicted on BLM-managed lands (e.g., 20 miles of seismic line). It is likely exploration on BLM-managed lands in either subunit would only result from expansion of exploration in the Yukon Flats basin by Doyon, Limited. The primary economic effects would result from Doyon, Limited, exploration, so it is difficult to isolate jobs and income resulting from activities on BLM-managed lands. Due to low level of effort on BLM-managed lands the additive environmental justice affects would be very low.

Cumulative effects resulting from mining on BLM-managed lands in any subunit would result from placer mining at scales far smaller than existing mining or proposed projects in the region. Table 4.10, "Direct Employment and Income" shows resulting employment due to new gold mining. Previous studies indicate changes in basic employment actually result in some opposite changes in employment in other sectors of the local economy, as individuals move from job to job within a community (Robertson 2003). It is possible that new employment for workers in small eastern Alaska communities would result. However, economic inputs multiplied would continue to register higher effects on a regional and statewide level.

4.3.3.3. Social Conditions

Many human impacts cannot easily be measured in economic terms, and are considered as social impacts. These include detractions from existing lifestyles, sense of place, community values,

and beliefs. In some cases, social impacts are described in terms of effects to social well being or quality of life. These terms include many aspects of individual or community life, such as amount and quality of available resources, from basic needs like food and water to recreation and creative opportunities. Beliefs that could affect well being include the sense of personal control over decisions affecting one's future, or the confidence that the government strives to act in ways that consider all stakeholders' needs.

Additional factors include the availability of public services such as schools, perceptions of public safety, and transportation constraints. Less tangible factors may include sense of place, community character, community values, and sense of community. Sense of place addresses the connection to an aspect or aspects of the landscape of the area. Community character is something that makes one community distinctive from others. Community values suggest shared values, shared experiences, or other homogeneous characteristics. Sense of community incorporates many, if not all, of the less tangible factors. For small towns and villages in the area, local schools provide a social focus and lend to the sense of community.

The social analysis included groupings that have been identified as most likely to be affected by this plan. These social groups are defined to facilitate the discussion of social impacts. The grouping action greatly simplifies members' beliefs and values, and does not address commonalities. In other words, individuals may identify with several groups. For this area, many individuals participate in or benefit from subsistence activities, whether they are Alaskan Native, miners, recreationists, or any other designation. As such, management actions that may benefit an individual in one aspect may have a negative impact to another aspect of his activities or well being.

Summary of Effects

Impacts to social conditions will result from a wide range of management decisions. Most impacts result in positive benefits to some individuals and groups, with negative impacts to others. For example, restrictions on OHV use may limit the range of federally qualified subsistence users and reduce use of an area by OHV recreationists, but expand opportunities for non-motorized recreation. Most impacts to individuals and groups are minor to moderate in part because other opportunities exist for the activities within the planning area and on nearby lands managed by the State of Alaska or a Native corporation. While it is possible for impacts for multiple resources to adversely affect individuals and groups in a cascading fashion, most individuals and communities exhibit sufficient resiliency to adapt. The only community where local concern was expressed about community viability before consideration of impacts was Central, and it was relayed that since the Circle Hot Springs resort closed, the town has been in decline, and the school is one pupil from closing. The potential lack of this key component of social web is an indicator of impaired resiliency, and the community may have greater difficulty adapting to some impacts.

4.3.3.3.1. Effects Common to All Alternatives for all Subunits

Effects from Air and Atmosphere

Smoke from wildland fire increases with the number and duration of fires in the area. Some effects on humans are noted elsewhere (See Air and Atmosphere, Recreation) – primarily short-term health risks with some decrease in tourism and recreation activities. Socially, communities with frequent or long-term fire smoke issues have a decreased sense of well being, and sometimes feel a reduced sense of community as individuals deal with the physical stress.

Effects from Cultural Resources

Accomplishing the research and awareness program goals will strengthen connections with the past and the land among some residents. If preservation activities preclude locally valuable economic or social activities, some members of the community may have a reduced quality of life.

Effects from Fish and Aquatic Species

Efforts to maintain or improve fish habitats have mixed impacts in the local communities. Abundant subsistence species provide for physical well being and a sense of food security, particularly when other subsistence resources are in short supply or out of season. Access to gravel, placer, and other mining activities provide the infrastructure and economic opportunities that allow some residents to remain in the area, and give some communities their character. Communities relying on placer mining (Chicken and Central, in particular) are less viable with reduced mining activity unless some other economic activity replaces mining. In both communities, mining opportunities also exist on state land.

Effects from Non-Native Invasive Species

Impacts cannot be evaluated until step-down plans, with changes to ROPs and leasing stipulations, are completed. If the result is to reduce economic activities within an area that has few cash-generating activities, personal and community well being may be diminished, or it may be strengthened by protecting subsistence species from competition.

Effects from Paleontological and Soil Resources Minor positive or negative social impact may occur related to protection of resources or limiting human activities.

Effects from Special Status Species

Existence of species provides a sense of well being for individuals and groups that value resource existence and diversity. Surveying Special Status Species for each new project and performing unknown mitigation action requirements may result in fewer employment and income-generating activities, reducing well being for some individuals and groups. Other impacts will not be known until Special Status Species management plans are developed.

Effects from Vegetative Communities

Requirements to revegetate fire lines reduces the number of possible OHV routes where areas are closed to off-trail travel, potentially limiting motorized recreation opportunities and reducing the areal extent of subsistence activities approved by permit due to time required for off-trail travel.

Effects from Visual Resources

To the extent that human activities are restricted by VRM class designations, there will be local positive (unimpaired senses of natural world and solitude) and negative (economic and possibly subsistence) impacts with broad existence-value benefits to some individuals and groups.

Effects from Water Resources

Minor positive or negative social impact may occur related to protection of subsistence resources or reduced economic activities.

Effects from Wilderness Characteristics

Under current management, no area is designated as wilderness, yet significant tracts continue to retain wilderness characteristics. Under all action alternatives, these areas will be closed to most or all economic activities. Subsistence activities in these areas are protected, but some limitations may be required, particularly in terms of OHV use. To the extent that these management decisions are applied to large areas in addition to climate change and other factors reducing subsistence food success, food security will be reduced for rural residents without alternative economic resources. This could reduce individual and community well being, and may reduce community viability. Provision for free special rural subsistence permits will create an additional burden for users, but should not reduce subsistence success or community well being. Limiting other OHV activities and retaining wilderness characteristics will increase well being for those valuing resource protection.

Effects from Wildland Fire Ecology and Management

Current wildland fire management options are seen locally as opportunities for small fires to grow quite large and require more substantial fire fighting resources than if addressed at a smaller stage. This observation is in part a reaction to the smoke and community disruption from large firefighting actions. The result is heightened frustration by the time firefighters are called in to fires near communities, but outside community protection zones. Wildland fire is a necessary component of this ecosystem, however years (such as 2004, 2005, and 2009) when several large fires consume significant areas of the Interior create greater emotional and physical stress, reduce subsistence in the immediate area for the short-term, and can limit tourism and recreation in the smoke-influenced area in both the short- and long-term.

Effects from Wildlife

Minor positive or negative social impact may occur related to protection of subsistence resources or reduced economic activities.

Forest and Woodland Products

Harvest of cabin logs and home firewood are not considered subsistence uses and will be allowed with appropriate permits and in compliance with the ROPs. Not all areas will be open to such use, though recreational firewood harvest of dead or downed wood is available throughout the planning area. For recreationists, this allows a more familiar camping experience, as long as low or moderate fire danger allows campfires. For residents, few live close enough to public land for it to be a convenient source of firewood. The exceptions are at Circle and Eagle. Land close to Circle may be disposed of to consolidate BLM lands and activities. Land close to Eagle is part of the Fort Egbert Historic Site or BLM's campground, and is unavailable for firewood in order to preserve some of the natural and historic environment. Given the other nearby sources, including recent fire-scorched trees, there is no significant impact to communities in the planning area.

Lands and Realty

Impacts are expected to be minor, and may be positive or negative. Opportunities for renewable energy may help individuals at scattered cabin sites or within villages, but no community- or region-level projects are likely, so the cost of energy will likely continue to be a large portion of individual and community budgets, affecting well being and quality of life.

Effects from Leasable and Salable Minerals

Social impacts are expected to be minor because of limited resource availability.

Effects from Locatable Minerals

Extensive withdrawals have limited this activity within the planning area. To the extent that withdrawals exist, mining will cease to be a significant aspect of public land use within the planning area. No remnant activities will occur on public land to give context to the various displays of the mining era. Reduced opportunities for participation at a lifestyle or recreational level will reduce individual well being, and community well being in Center and Chicken.

Preventing or reducing placer mining may improve subsistence catches of some fish species. This will increase the sense of well being among populations targeting such species, and will increase food security if other food sources are displaced by wildland fire, climate change, or other factors.

Effects from Recreation

Minor positive or negative social impact related to reduced subsistence or economic activities, while maintaining or improving a spectrum of recreational opportunities.

Effects from Travel Management

Minor positive or negative social impact related to reduced economic activities, while maintaining or improving a spectrum of recreational opportunities. Approving the use of free permits for federally qualified subsistence users creates an administrative burden, but may increase target species and success.

Effects from Withdrawals

In the action alternatives, some areas will be open to new mineral claims and leasing for the first time in over a generation. Additional placer mining could reduce target fish species, creating a reduced sense of food security for federally qualified subsistence users. Those that benefit economically from mineral extraction could have increased quality of life. Among recreationists, those who see human impacts as detrimental to their experience would have a reduced quality of life, while those that participate in recreational mining or enjoy the connection to the past would have an increased quality of life. Those who value opportunities for resource use would have a greater quality of life with withdrawals lifted, while those who value semi-pristine landscapes would have a reduced quality of life.

Effects from Special Designations

Wild and Scenic Rivers - Minor positive or negative social impact related to reduced subsistence or economic activities, while maintaining or improving a spectrum of recreational opportunities.

Effects from Hazardous Materials

Minor positive or negative social impact because of limited activities.

Effects from Subsistence

A high priority among resource uses is to provide for habitat conservation to support abundant target species populations, in part by limiting other resource uses. As subsistence is key to physical and cultural well being of many people within the planning area, this supports individuals and communities. It can also displace cash market activities, limiting economic well being of those not participating in subsistence activities, as well as limiting the means to earn cash for subsistence participants to acquire equipment and supplies required from the cash market.

In addition to food security, subsistence is a key component of Alaska Native culture; a personal and social responsibility, a connection with kin and the broader community, and a connection with the land in a manner that defines aspects of individual communities. Protection of subsistence rights and resources increases Alaska Native social well being.

4.3.3.3.2. Alternative A (No Action)

While some groups have a higher level of well being and quality of life, others feel their interests have not been taken into consideration, so have a reduced quality of life. Some current management decisions are made on a project-specific basis, which can lead to a sense of inequity or uncertainty when activities are proposed or when attempting to comply with requirements, which results in a lower quality of life by challenging belief systems for both resource users and resource protectors. In particular, some individuals and groups can feel that their interests are not considered.

4.3.3.3.3. Alternative B

Institutes significant changes from current management, causing distractions from existing lifestyles for some residents and visitors. These changes result in improved quality of life for those who value non-motorized recreation, existence of wilderness or near-pristine natural conditions, and provide potential improvement in well being for individuals using some subsistence resources and areas that will be protected. Current users relying on motorized vehicles will have a decline in well being and quality of life because they will not be able to access some remote locations for recreational activities, including retrieving non-subsistence game by using motorized transport. Federally qualified subsistence users desiring to access remote areas will need to acquire free OHV permits, available at several locations or by telephone and mail. Opportunities for improved well being include limited openings to mineral exploration and development.

4.3.3.3.4. Alternative C

Alternative C seeks to provide a higher level of protection to highly valued resources and locations while maintaining or increasing resource use, resulting in a minor net change to quality of life that may be positive or negative to communities and groups. Protection areas are greater than current management or Alternative D, but less than Alternative B. Individuals and groups that value non-motorized recreation, existence of wilderness or near-pristine natural conditions, and those who use subsistence resources provided greater protection will still see an improved well being or quality of life, but to a lesser degree than Alternative B and a greater degree than Alternative A or D. Users relying on motorized vehicles will have a decreased sense of freedom as some areas and activities, but to a lesser degree than Alternative B and to a greater degree than Alternative A and D. OHV restrictions provide some areas where travel off designated routes allow hunters to retrieve game, which will improve the well being of recreational hunters over Alternative B, but less than Alternatives A or D. OHV use permits for federally qualified subsistence users will also be available under this alternative.

4.3.3.3.5. Alternative D

Alternative D lifts withdrawals after conveyances, and institutes some protections by restricting current uses. This alternative limits OHV travel in all subunits to address advances in OHV/UTV technology and resulting environmental concerns, which may decrease OHV users quality of life

while increasing that for those who do not use OHVs or who value more natural vistas. OHV use permits for federally qualified subsistence users will also be available under this alternative. The alternative opens more areas to economic and potential well being net benefits from mineral entry.

4.3.3.3.6. Cumulative Effects for all Subunits

Since of the varied land ownership, with multiple levels of opportunities and protections available, the communities within the planning area are likely to retain current characters and values through the anticipated activities included in the cumulative case.

Groups will feel pressures from a variety of sources. Subsistence users will be affected by changes in the amount and quality of available resources resulting from climate change and related events, primarily related to losses of the sense of food security and sense of personal control over decisions affecting one's future. Decisions pertaining to the public lands seek to protect subsistence resource habitat. Mineral development on and off public land may lead to challenges for Alaska Natives, while providing economic opportunities that improve well being in terms of basic needs. Recreationists may face decreased opportunities for certain activities and decreased solitude, reducing their quality of life to the extent they do not embrace other activities or if they feel their needs have not been considered. The public lands are only one component of an array of recreational opportunities, and changes in the different alternatives do not preclude activities. Most of the planning area has been closed to mineral entry for a generation, and the action alternatives are written in expectation that some withdrawals will be lifted. Nearby lands have been open to mineral entry, though they may not have the mineral potential of some public lands. Miners who seek recreational and commercial opportunities will have an improved quality of life under the action alternatives, but also have opportunities away from public lands if the withdrawals are not lifted. Groups that prioritize resource protection may have a net increase or reduction in quality of life resulting from the sense that new protections do or do not outweigh continued use and new development in the area.

4.3.3.4. Subsistence

Summary of Effects

ANILCA Title VIII § 802(2) provides that "nonwasteful subsistence uses of fish and wildlife and other renewable resources shall be the priority consumptive uses of all such resources on the public lands of Alaska when it is necessary to restrict taking in order to assure the continued viability of a fish or wildlife population or the continuation of subsistence uses of such population, the taking of such population for nonwasteful subsistence uses shall be given preference on the public lands over other uses." Other renewable resources include timber, berries, bark, and other vegetation. Restricting other uses to provide a preference for subsistence uses is outside the scope of this plan and is regulated through the Federal Subsistence Board, as established through ANILCA.

Any land disturbing activities have the potential to alter habitat (change vegetation structure either by removal and or introduction of less desirable communities or NIP), create barriers or directly disturb subsistence resources and impact distribution and availability of the resources. Subsistence resources include fish, wildlife, timber and woodland products, berries, and other vegetation.

ANILCA Title VIII § 810 requires an evaluation of effects on subsistence resources and uses from proposed land use activities on public lands. Impacts of management decisions on subsistence

within each alternative and subunit are analyzed in this chapter and in the ANILCA § 810 Analysis of Impacts to Subsistence (Appendix J, *ANILCA Section 810 Analysis*).

4.3.3.4.1. Effects Common to All Alternatives

Proposed management of the following resources, resource uses and programs would have no anticipated negative impacts to subsistence and will not be analyzed further: Cave and Karst, Visual Resources, Wilderness Characteristics, Renewable Energy, Special Designations, and Hazardous Materials.

The following resources, resource uses and programs would have minor effects on subsistence and will not be analyzed under impacts specific to subunits: Air and Atmospheric Values, Cultural and Paleontological Resources, Fish and Aquatic Species, Non-Native Invasive Species, Soil Resources, Special Status Species, Vegetative Communities, Water Resources, Wildland Fire Ecology and Management, and Wildlife. All other resources, resource uses and programs, including recreation, travel management, and locatable and leasable minerals, will be discussed by subunit.

Effects from Air and Atmospheric Values

Management of air and atmospheric values is expected to have minimal impact on subsistence uses and resources. Wildland fire suppression actions initiated to meet air quality laws and regulations may interrupt natural fire cycles that benefit subsistence resources. Impacts are not expected to be significant because although wildland fire can be deferred, it cannot be eliminated, especially in fire dependent ecosystems, such as the interior boreal forest.

Effects from Cultural and Paleontological Resources

Management of cultural and paleontological resources on BLM-managed lands is conducted under National Historic Preservation Act, other federal laws and regulations, Executive Orders and other applicable BLM guidance for the protection of these resources. Some activities may include use of helicopter for access, which would temporarily displace wildlife resources. Most of these activities are conducted outside of periods important for harvest of subsistence resources and impacts are expected to be minimal. Inventory, research, rehabilitation, protection, use or other related program activities are not expected to impact subsistence uses or resources in any of the subunits or under any of the alternatives.

Effects from Fish and Wildlife Resources

Fish and wildlife resources in the planning area are important to most federally qualified subsistence users in and adjacent to the planning area. Some fish and wildlife activities may include use of helicopter for access, which would temporarily displace wildlife resources. Most of these activities are conducted outside of periods important for harvest of subsistence resources and impacts are expected to be minimal. Management of fish resources and mitigation of impacts to fish are expected to benefit subsistence resources through maintenance of healthy, functioning watersheds, riparian areas and associated fish habitats. (Refer to Fish and Aquatic Species in Chapter 2 and Chapter 4 for further discussion on management of and impacts to fish resources.)

Effects from Invasive Species

Invasive species can alter vegetative communities, and fish and wildlife habitat, which impacts subsistence resource populations. Under all alternatives and subunits, the intent for management of invasive species is to reduce their impact within and adjacent to the planning area. Management of invasive species in Alaska is largely possible through early detection and rapid response. In some cases, more intensive integrated pest management may be employed. Management of non-native invasive species will use best integrated pest management (IPM) practices that reduce impacts to other resources, including subsistence resources, uses and access to resources. A step-down Invasive Species Management Plan will be developed within five years of signing the RMPs. Proposed IPM treatments will be analyzed at the project level through NEPA and an ANILCA Title VIII § 810 Evaluation and Finding will be conducted.

Effects from Soil Resources

Management decisions to reduce erosion and impact to soil profiles from all authorized surface-disturbing activities and to maintain watersheds in proper functioning condition will protect subsistence opportunities, uses and resources. Decisions that will protect soil resources will also protect subsistence resources, which include weight limits on OHV use, and weight and depth of frozen ground and snow cover for winter overland travel. No adverse impacts are expected from management of soil resources.

Effects from Special Status Species

No adverse impact to subsistence resources or uses is expected from management prescriptions for special status animal and plant resources and communities. Management that safeguards against the need to list species under the Endangered Species Act will benefit subsistence resources by protecting habitats and plant communities upon which they rely.

Effects from Vegetative Communities Management

No adverse impacts to subsistence resources or uses or access to resources is expected from management of vegetative communities within the planning area. Vegetation management decisions will benefit subsistence resources by ensuring that habitats support healthy, productive, and diverse populations and communities of native plants and animals.

Effects from Water Resources

No adverse impacts to subsistence resources or uses are anticipated from management of water resources. The management focus is on maintaining or improving water quality, which will benefit subsistence resources. Ensuring maintenance of sufficient in-stream flow in the three Wild and Scenic Rivers in the planning area will also benefit subsistence resources.

Effects from Wildland Fire Ecology and Management

Wildland fire has been and continues to be a normal and dominant factor in ecosystem processes in the planning area. Boreal forests are fire dependent systems and disturbance by wildland fire is important as a natural agent of change. Much of BLM-managed lands in the planning area are in Limited or Modified fire management options, allowing a more natural fire regime. Fire management options can be amended to respond to changing ecological and other conditions (BLM 2005b). Options in critical habitats can be changed to lower or higher protection levels to allow or defer wildland fire from the area.

Decades of wildland fire deferral in Alaska have resulted in buildup of fuels. Drought conditions have occurred in some regions of the planning area. Potential results from wildland fire deferral and changes in climatic conditions are larger and more frequent fires. Increased emphasis on suppression to avoid larger fires (whether to protect air quality, timber or other resources), may impact wildlife habitat by changing ecosystem processes.

Natural wildland fire occurrence and active fire management have the potential to impact subsistence resources by altering the distribution and movements of a species or through direct changes to a population. The impacts can be positive or negative. Alteration of distribution and migration patterns may be relatively long-term, as in the case of fire on winter caribou range (Collins et al., 2011), or short-term, as in renewal of moose browse. The effects of wildland fire on caribou winter range can alter availability of resources to federally qualified subsistence users for many years. Impacts to subsistence resources (wildlife, fish, vegetative communities, forests and forest products) as a result of wildland fire and fire management decisions are discussed further in sections 4.3.1.4, 4.3.1.8, 4.3.1.12, and 4.3.2.1, and under discussion of impacts to specific subunits.

Impacts on subsistence resources and uses as a result of wildland fire and fire suppression activities are expected to be minimal within the planning area. Mitigation designed to reduce impacts of fire suppression activities includes limitations on use of dozer lines and off-road vehicles, rehabilitation of lines, and measures to prevent the introduction and spread of non-native invasive plants. (Impacts to vegetative communities and wildlife habitat by non-native invasive plants are discussed in sections 4.3.1.8 and 4.3.1.12, and in sections on specific subunits).

Prescribed burns and hazard fuel reduction could be proposed within the planning area over the life of the plan. In most cases, either action would be beneficial to subsistence resources. Such actions would be fully analyzed as an environmental assessment and include rigorous stipulations to mitigate impacts to subsistence and other resources.

Effects from Wildlife Resources

Wildlife resources in the Eastern Interior are important to federally qualified subsistence users in and adjacent to the planning area. Management of wildlife resources and mitigation of impacts to wildlife are expected to benefit subsistence resources through maintenance of natural ecosystem functions and the quality and quantity of habitat to support healthy populations of wildlife. (See Chapter 2 Wildlife for management decisions for wildlife and Chapter 4 for impacts to wildlife.)

Effects from Forest and Woodland Products

Commercial harvest of forest and woodland products and personal harvest of forest products on lands managed by the BLM requires a permit. Personal use of woodland products does not require a permit. A NEPA process is conducted for commercial permits. Impacts to subsistence resources and uses are analyzed and appropriate stipulations are applied to the permit to mitigate impacts. Where alternatives include closures to free-use of timber resources, impacts will be analyzed by alternative within subunits.

Effects from Lands and Realty

Lands disposed of will become managed only under state regulations for fishing, hunting, trapping and use of vegetation and forest products. In some cases, regulations on these lands may be more restrictive than the federal regulations on BLM-managed lands. Where access to federal public

lands is across lands conveyed through ANCSA, easements may be created to the benefit of subsistence and all users.

Lands acquired by the BLM would be managed under Federal Subsistence Management Regulations for federally qualified subsistence users. In most of the planning area, state and federal regulations allow the same bag limits, seasons, methods and means, differences primarily being in season dates. Where seasons currently differ, little BLM public land is identified for exchange, disposal or acquisition.

Within the planning area, the transfer of lands identified for potential acquisition, disposal or exchange is not expected to impact subsistence uses or resources. In most cases changes in land tenure will be beneficial for federally qualified subsistence users. Consolidation of scattered lands into blocks will make it easier for users to identify land status on the ground, lessening uncertainty of which regulations affect the area. Common to all alternatives for the Steese and Upper Black River Subunits is the identification for exchange lands around the village of Circle.

4.3.3.4.2. Cumulative Effects

Cumulative impacts on subsistence are discussed under impacts specific to the subunits and in Appendix J, *ANILCA Section 810 Analysis*.

4.4. Impacts Specific to the Fortymile Subunit

4.4.1. Resources

4.4.1.1. Cultural and Paleontological Resources Fortymile Subunit

Summary of Effects

See section 4.3.1.3 Effects Common to All Alternatives, Impacts common to All Subunits.

4.4.1.1.1. Alternative A (No Action)

Effects from Locatable Minerals

At present, direct and indirect adverse effects from the locatable minerals program on cultural and paleontological resources occur only on existing, federal mining claims, of which there are currently 11,000 acres in the subunit. All other lands, more than 2,000,000 acres, are presently withdrawn from mineral entry and leasing under ANCSA 17(d)(1) withdrawals. Most if not all locatable mineral mining that is presently occurring is surface-disturbing, open-air mining, and not underground mining which is accessible through shafts and adits, that would otherwise leave the upper ground surface undisturbed.

Three types of placer mining operations could occur: (1) suction dredge operations, where the only surface disturbance relates to the supporting camp, (2) small-scale placer mines, where disturbance is limited to less than five acres per operation, with an assumed total area of 20 to 30 acres for the life of each mine, and (3) large-scale placer mines, where disturbance is estimated at five to twenty acres per operation, with an assumed total area of 60 to 80 acres for the life of each mine.

Further assumptions for locatable minerals for Alternative A in the Fortymile Subunit indicates six suction dredge operations annually, 27 small-scale placer mines, and two large-scale mines. This equates to 684-994 acres of disturbed ground, in areas that very likely contain evidence of prior, historic mining operations, which have occurred throughout the Fortymile drainage for at least the previous 120 years. Disturbance to prehistoric sites by any particular operation would have to be assessed on project-specific basis. In sum, locatable mineral mining will likely directly and adversely impact all manner of cultural and paleontological resources.

In addition, new access roads often need to be constructed in order to reach new mineral claims. The construction of new roads not only has direct adverse impacts on cultural and paleontological resources, but would also have an indirect effect by providing new access to previously isolated lands. With improved access, there would be an increased potential of more people finding surface cultural resources and adversely impacting them, either intentionally or unintentionally.

Effects from Recreation

A wide range of recreational opportunities are available and are authorized in the Fortymile Subunit, including established campgrounds, private and commercial floating, and both motorized and non-motorized overland travel. The construction of infrastructure to support these activities can be ground disturbing, and thus could directly affect cultural and paleontological resources.

Also, visitors to the public lands may find surficial cultural and paleontological resources, and thus have the potential to adversely impact such resources, either intentionally or unintentionally.

Effects from Travel Management

Based upon current trends, the BLM assumes ever increasing travel visitation and use, both motorized and non-motorized in the Fortymile Subunit, with OHV use accounting for the majority of travel-related activities. The current visitation rate of increase is approximately ten percent per year, which is expected to continue for the foreseeable future. At this rate, travel visitation in the Fortymile Subunit would be expected to double within the next 10 years. Additional trails and mechanisms for managing these trails would be necessary. Some new trails, for both motorized and non-motorized activities, as well as other travel facilities such as boat launches, may need to be constructed. Construction of new trails, like any other surface-disturbing activities, would have the potential to directly and adversely affect cultural and paleontological resources.

In addition, the construction of new trails would also have an indirect effect by providing new access to previously isolated lands. With improved access, there would be an increased potential of more people finding surface cultural resources and adversely impacting them, either intentionally or unintentionally.

4.4.1.1.2. Alternative B

Effects from Locatable Minerals

Alternative B would have the same direct and indirect effects on cultural and paleontological resources as Alternative A, except the potential impacts to these resources would be increased as new areas would be opened to potential mining activities and more roads would potentially need to be built to access those areas. In Alternative B, 1,012,000 acres would be closed and more than 1,500,000 acres of previously withdrawn lands would be open to locatable mineral entry (Map 26). Closed areas include all of the Fortymile WSR, the Fortymile SRMA, the Fortymile ACEC, one mile around mineral licks, disposal lands, BLM administrative sites, Fort Egbert, and the Eagle recreation withdrawal.

See Alternative A for assumptions about the nature and type of placer mining operations that are likely to occur within the Fortymile Subunit. Further assumptions for Alternative B indicates 10 suction dredge operations in any given year, 31 small-scale placer mines, and three large-scale mines. This equates to approximately 840-1,210 acres of disturbed ground, in areas that very likely contain evidence of prior, historic mining operations, which have occurred throughout the Fortymile drainage for at least the previous 120 years. Disturbance to prehistoric sites by any particular operation would have to be assessed on a project-specific basis. In sum, locatable mineral mining will likely directly and adversely impact all manner of cultural and paleontological resources.

Effects from Recreation

In Alternative B, the Fortymile SRMA would be created (792,000 acres). A wide range of recreational opportunities would be available and/or authorized in seven Recreation Management Zones (RMZs). The “setting characteristics” for these RMZs range from Semi-Primitive, Backcountry, Frontcountry, Middlecountry, and Rural settings (Map 41). The recreation management objectives associated with each of these is well defined, with differing emphases on building and maintaining facilities, trails, and a range of summer and winter OHV uses.

Construction of public and administrative facilities by the BLM to meet recreational demand can directly and adversely impact surface and subsurface cultural and paleontological resources. The BLM assumes a ten to fifteen percent increase over the life of the plan in demand for recreational users and visitation (both motorized and non-motorized), resource damage, and user-resource conflicts. The construction of infrastructure to support these activities would likely be ground disturbing, and thus can potentially directly affect cultural and paleontological resources. Also, any increased visitation to the public lands has a concurrent potential increase for inadvertently finding surficial cultural and paleontological resources and adversely impacting such resources, either intentionally or unintentionally.

Effects from Travel Management

A Travel Management Plan would be developed for the Fortymile Subunit after approval of the RMP. Until that time, interim management would apply under Alternative B. Summer OHV use would be limited to existing routes. Summer OHV use on existing routes, and snowmobile use both on and off trails in the winter would have little or no effect on cultural or paleontological resources. As a result, there would be no direct adverse effect to cultural and paleontological resources prior to the writing and implementation of a separate Travel Management Plan.

However, the current visitation rate of increase is approximately ten percent per year, which is expected to be maintained for the foreseeable future. Even if most of this is assumed to be by OHV users, there is still a probable increase in use by non-motorized users in the subunit, both on and off established trails. With more resource users accessing BLM-managed lands, there would be an increased potential of more people finding surface cultural resources and potentially adversely impacting them, either intentionally or unintentionally.

4.4.1.1.3. Alternative C

Effects from Locatable Minerals

Alternative C would have the same direct and indirect effects on cultural and paleontological resources as Alternative A, except the potential impacts to these resources would be increased as more land would be opened to potential mining activities and more roads would potentially need to be built to access those areas. In Alternative C, 504,000 acres would be closed and more than 2,000,000 acres of previously withdrawn lands would be open to locatable mineral entry (Map 28). The closed areas in Alternative C would be the same as those in Alternative B, except more of the Fortymile ACEC would be opened to potential development. Alternative C has more acres opened to potential mineral activity than Alternative B, and thus would have a greater potential for adverse impacts to cultural and paleontological resources.

See Alternative A for assumptions about the nature and type of placer mining operations that are likely to occur within the Fortymile subunit. Further assumptions for locatable minerals for Alternative C indicates 14 suction dredge operations in any given year, 33 small-scale placer mines, and three large-scale mines. This equates to approximately 896-1,286 acres of disturbed ground, in areas that very likely contain evidence of prior, historic mining operations, which have occurred throughout the Fortymile drainage for at least the previous 120 years. Disturbance to prehistoric sites by any particular operation would have to be assessed on a project-specific basis. In sum, locatable mineral mining will likely directly and adversely impact all manner of cultural and paleontological resources.

Effects from Recreation

In Alternative C, a smaller Fortymile SRMA would be created (249,000 acres). A wide range of recreational opportunities would be available and/or are authorized in nine RMZs, covering a wide range of established and well defined "setting characters" ranging from Semi-Primitive, Backcountry, Frontcountry, Middlecountry, and Rural settings (Map 42). Alternative C is overall very similar to Alternative B, except there are more acres in Frontcountry and Middlecountry RMZs and fewer acres in Semi-Primitive and Backcountry RMZs. There would be a concomitant rise in potential adverse effects on cultural and paleontological resources under Alternative C, as there would be more emphasis on recreational infrastructure development.

Effects from Travel Management

Same as Alternative B.

4.4.1.1.4. Alternative D

Effects from Locatable Minerals

Alternative D would have the same direct and indirect effects on cultural and paleontological resources as outlined in Alternative A, except the potential impacts to these resources would be increased as more lands would be opened to potential mining activities and more roads would potentially need to be built to access those areas. In Alternative D, 51,000 acres would be closed and about 2,500,000 acres of previously withdrawn lands would be open to locatable mineral entry (Map 30), including the "scenic" segments of the Fortymile WSR Corridor and portions of the Wade Creek "recreational" segment; Alternatives A, B, and C exclude the entire Fortymile WSR Corridor. Alternative D has more acres opened to potential mineral activity than Alternatives B and C, and thus would have a greater potential adverse impact to cultural and paleontological resources. In addition, the number of known cultural resources within the "scenic" and "recreational" segments of the WSR corridor is quite dense relative to areas in the "wild" segments and outside of the corridor (about 159 sites in 103,000 acres, compared to 119 sites in 1,973,000 acres). The adverse impacts upon cultural and paleontological resources by Alternative D, relative to Alternatives B and C, would be much greater.

See Alternative A for assumptions about the nature and type of placer mining operations that are likely to occur within the Fortymile Subunit. Further assumptions for locatable minerals for Alternative D indicates 18 suction dredge operations in any given year, 34 small-scale placer mines, and three large-scale mines. This equates to approximately 932-1,332 acres of disturbed ground, in areas that very likely contain evidence of prior, historic mining operations, which have occurred throughout the Fortymile drainage for at least the previous 120 years. Disturbance to prehistoric sites by any particular operation would have to be assessed on a project-specific basis. In sum, locatable mineral mining will likely directly and adversely impact all manner of cultural and paleontological resources.

Effects from Recreation

Same as Alternative C, except there would be 10 RMZs created, with even more acreage devoted to Frontcountry and Middlecountry RMZs and less acreage to Semi-Primitive and Backcountry RMZs. As a result, there would be an increased potential for adverse effects on cultural and paleontological resources under Alternative D relative to Alternative C, as there would be more emphasis on recreational infrastructure development.

Effects from Travel Management

Same as Alternative A.

4.4.1.2. Fish and Aquatic Species Fortymile Subunit

Summary of Effects

Fish and aquatic resources would be primarily affected by surface-disturbing activities (such as placer mining or trail construction) which alter stream channels, remove or damage riparian vegetation, or result in soil erosion and sedimentation to fish and aquatic habitat. The level of impact would depend on the success and adequacy of protective measures.

Table 4.6. Stream Miles and Acres Open to Locatable Mineral Entry, Fortymile Subunit

STEESE SUBUNIT (BLM-managed lands)	ALTERNATIVES			
	A	B	C	D
Stream miles	3,700	3,700	3,700	3,700
Stream miles open to locatable minerals (proposed)	0	1,547	2,355	3,263
Stream miles open to locatable minerals (proposed) plus miles within current valid federal claims	75	1,622	2,430	3,338
Stream miles outside RCAs in areas open to locatable minerals (proposed)	75 (100%)	1,604 (99%)	2,430 (100%)	3,338 (100%)
Acres open to locatable minerals (proposed)	0	952,000	1.5 million	1.9 million
Acres open to locatable minerals (proposed) plus acres within current valid federal claims	10,000	962,000	1.5 million	1.9 million
Anticipated stream gravel disturbance by suction dredging during life of plan measured in cubic yards	240,000	400,000	560,000	720,000
Potential impacts to fish and aquatic habitat (1-4, 4 = greatest)	1	2	3	4

4.4.1.2.1. Alternative A (No Action)

Effects from Leasable Minerals

No lands within the Fortymile Subunit are open to leasing of either fluid minerals (oil and gas) or solid minerals (coal). There are no existing mineral leases. Under this alternative, impacts to fisheries and aquatic resources would be non-existent.

Effects from Locatable Minerals

No lands within the Fortymile Subunit are open to new locatable mineral entry subject to valid existing claims. Current active federal mining claims occur on 10,000 acres, but not all of those acres are being mined. Including current valid federal claims, this alternative has 75 stream miles open to locatable minerals which is the least amount as compared to Alternatives B, C, and D (Table 4.6, “Stream Miles and Acres Open to Locatable Mineral Entry, Fortymile Subunit”). The anticipated number of acres directly disturbed by small- and large-scale placer mines under Alternative A is estimated at up to 970 acres, or approximately 14 miles of stream over the life of the plan.

It is anticipated that during the life of the plan 60 suction dredging operations would occur within the subunit. It is assumed that each operation would last two years (this applies to all alternatives). The amount of stream gravel disturbed from one suction dredging operation is estimated to be 2,000 cubic yards per year. During the life of the plan 240,000 cubic yards of stream gravel could be disturbed. In general, the impacts associated with suction dredging are described in the Common to All Alternatives section 4.3.1.4. Impacts from suction dredging would be localized and minor if suction dredging operations were restricted in areas where fish are actively spawning or where spawning has recently occurred. Suction dredging in this alternative would have the lowest impact due to the least amount of gravel disturbance (Table 4.6, "Stream Miles and Acres Open to Locatable Mineral Entry, Fortymile Subunit").

Fish species impacted from locatable mineral activity in the this subunit would typically be Arctic grayling and whitefish species, since they are the predominant species in the subunit. Under Alternative A, protection of fish and aquatic habitat would rely on current regulations and mitigation measures developed during project-specific NEPA analysis. Impacts to fish and aquatic resources in this alternative would be considered low to moderate, but could have long-term effects resulting in an overall decrease in levels of fish populations at the local level. Compared to the other alternatives, Alternative A would likely provide the greatest protection to fisheries and aquatic resources, because it would result in the least amount of potential disturbance (Table 4.6, "Stream Miles and Acres Open to Locatable Mineral Entry, Fortymile Subunit"). However, under this alternative, fish and aquatic resources may not benefit from the higher reclamation standards and ROPs proposed in this plan which are designed to minimize impacts and reduce recovery time. As such, Alternative A may have similar adverse long-term impacts than other action alternatives.

Effects from Recreation Management

Impacts would be similar to those described in Common To All Alternatives. There are no SRMAs that would identify recreation objectives or establish visitor use limits. Unmanaged trail proliferation would continue to occur with no established standards to ensure the proper construction and placement of new trails. Alternative A would provide the least protection to fish and aquatic habitats from recreation activities, however impacts to fish and aquatic habitat are expected to be minimal.

Effects from Travel Management

Within the Fortymile WSR Corridor, OHV use is limited to 1,500 pounds GVWR and less and off-road travel is authorized. Travel outside the Fortymile WSR is generally unrestricted providing for off-road travel for vehicles weighing under 6,000 pounds GVWR. OHV use is assumed to increase during the life of the plan, therefore trail proliferation would be expected to increase under this alternative with a resulting increase in erosion and sediment impacts. Based on these assumptions, this alternative could have moderate adverse short- and long-term impacts on fish and aquatic resources. This alternative has more potential to effect fish and aquatic habitat than Alternatives B, C, and D.

Effects from Special Designations

The Fortymile WSR Corridor is withdrawn from mineral entry and mineral leasing, except for valid existing claims. Fish and aquatic habitats benefit in areas closed to mineral entry, because the habitat generally remains intact. These withdrawals reduce future adverse impacts on fish and aquatic habitat from mineral development.

4.4.1.2.2. Alternative B

Effects from Leasable Minerals

Under Alternative B, 976,000 acres would be open to mineral leasing. Although lands would be open to fluid minerals (oil and gas) and solid minerals (coal) leasing, limited potential exists for these resources within the subunit. Industry has shown no interest in leasing or development in the Fortymile Subunit. If leasing occurred, further NEPA analysis would be required. Based on the limited leasable mineral potential in the subunit, it is assumed that seismic surveys would not occur. Given those assumptions, impacts to fisheries and aquatic habitat would be minimal or nonexistent.

Effects from Locatable Minerals

Under Alternative B, 962,000 acres would be open to locatable mineral entry (Map 26). A large portion of the fish and aquatic habitats in the subunit are located within the Fortymile WSR Corridor, Fortymile ACEC, and the Fortymile SRMA, which would be closed to locatable minerals. Including valid existing federal mining claims, approximately 1,600 miles, or forty-four percent of the stream miles within the entire subunit would be open to locatable minerals. Only one percent of those miles occur within RCAs, which require higher reclamation standards. Under Alternative B, ninety-nine percent of the stream miles open to locatable minerals would rely on the current regulations, reclamation requirements and ROPs outlined in this plan, and mitigation measures developed during project-specific NEPA analysis to ensure sustained yield of fisheries resources. The likelihood of impacts would be greatest in areas of medium to high mineral potential, which equates to roughly 822 of the 1,622 miles that are open to locatable mineral entry. The anticipated number of acres directly disturbed by small- and large-scale placer mines under Alternative B is estimated at 1,200 acres, or approximately 17 miles of stream over the life of the plan (BLM 2009c, BLM 2011).

One hundred suction dredging operations are anticipated during the life of this plan (BLM 2009c, BLM 2011). The amount of stream gravel disturbed from one suction dredging operation is estimated to be 2,000 cubic yards per year. During the life of the plan 400,000 cubic feet of stream gravel could be disturbed. In general, the impacts associated with suction dredging are described in the Impacts Common to All Alternatives section 4.3.1.4. Potential impacts from suction dredging under this alternative are greater than in Alternative A due to increased disturbance (Table 4.6, “Stream Miles and Acres Open to Locatable Mineral Entry, Fortymile Subunit”).

Over 800 miles of stream with medium to high mineral potential and forty-four percent of the stream miles within the entire subunit would be open to locatable minerals, impacts to fish and aquatic resources in this alternative may be low to moderate with long-term (10–20 years) effects. This would result in decreased levels of fish populations and habitat at the local level. Based on the amount of potential disturbance, adverse impacts to fish and aquatic habitat under this alternative would be greater than under Alternative A and less than Alternatives C and D.

Effects from Recreation Management

Impacts would be similar in type to those discussed under Common to All Alternatives. Under Alternatives B, C, and D, SRMAs would contain RMZs, each of which would be managed for specific activities, experiences, and benefits in a corresponding prescribed setting (Primitive, Semi-Primitive, Backcountry, Middlecountry, Frontcountry and Rural). Impacts to fisheries and aquatic resources would be lowest in Primitive Zones and would gradually increase across the

range of management zones with the greatest impacts being realized in the Rural Zones. In these zones, impacts would be associated with increased visitor use and landscape alterations, such as roads and trails leading to increased trampling of riparian vegetation and potential erosion. This alternative has the greatest number of RMZs on the Primitive end of the scale and thus provides the least potential impacts. In this alternative the Fortymile SRMA would contain 792,000 acres and have seven different management zones. This alternative would provide more protection to fish and aquatic habitat than Alternative A, D, and, C. Impacts to fish and aquatic habitat are expected to be minimal under this alternative.

Effects from Travel Management

In this alternative, OHV use is restricted to existing routes (off-road travel is prohibited) and to vehicles weighing 1,500 curb weight and less. Thirty percent of the subunit would be designated as Semi-Primitive, which prohibits the summer use of OHVs. Alternative B would provide the greatest protection to fish and aquatic habitat. Impacts to fish and aquatic habitat are expected to be minimal under this alternative.

Effects from Special Designations

The effects from the Fortymile WSR are similar to those in Alternative A. In addition, the Fortymile ACEC would be established for the protection of caribou and Dall sheep habitats. This ACEC would close an additional 516,000 acres to entry, location, and leasing of minerals subject to valid existing rights. A mining Plan of Operations would be required on any mining activity within the ACEC. Fish and aquatic resources within the ACEC would benefit from mineral entry closure by limiting the adverse impacts from mining to valid and existing claims. In addition, the Plans of Operation requirement would entail the incorporation of specific fisheries rehabilitation measures. Outside of the Fortymile WSR Corridor, habitats would potentially benefit from the increased resource protection accompanying the special designation.

Under Alternative B, five miles of Dome Creek and four miles of Gold Run Creek would be recommended as suitable for designation as WSRs. These creeks are likely to support Arctic grayling and whitefish species. Fisheries and aquatic resources benefit from WSR designations because of development limitations and closures to mineral entry and leasing. Impacts from special designation to fisheries and aquatic resources would be the most beneficial under this alternative.

4.4.1.2.3. Alternative C

Effects from Leasable Minerals

Under Alternative C, 1.4 million acres would be open to mineral leasing. Although lands would be open to fluid minerals (oil and gas) and solid minerals (coal) leasing, the limited potential exists for these resources within the subunit. Industry has shown no interest in leasing development in the Fortymile subunit. If leasing occurred, further NEPA analysis would be required. Based on the limited leasable mineral potential in the subunit, it is assumed that seismic surveys would not occur. Given those assumptions, impacts to fisheries and aquatic habitat would be minimal or nonexistent. Impacts under this alternative are potentially greater than in Alternatives A and B, because more acres are open to disturbance.

Effects from Locatable Minerals

Under Alternative C, 1.5 million acres would be open to locatable minerals. The Fortymile WSR Corridor, a smaller Fortymile ACEC, and the Fortymile SRMA would remain closed to locatable minerals (Map 28). Including valid existing federal mining claims, this alternative allows for an additional 800 stream miles to be opened to locatable minerals as compared to Alternative B (Table 4.6, “Stream Miles and Acres Open to Locatable Mineral Entry, Fortymile Subunit”), none of which would be within RCAs requiring a higher standard for reclamation. Under Alternative C, fisheries and aquatic resources open to locatable minerals would rely on the current regulations, reclamation requirements and ROPs outlined in this plan, and mitigation measures developed during project-specific NEPA analysis.

Of the 2,430 miles of stream open to locatable minerals, approximately 1,200 stream miles fall within areas having medium to high mineral potential. The anticipated number of acres directly disturbed by small- and large-scale placer mines under Alternative C is estimated at up to 1,200 acres, or approximately 18 miles of stream over the life of the plan. In addition, 140 suction dredging operations are anticipated during the life of this plan. The amount of stream gravel disturbed from one suction dredging operation is estimated to be 2,000 cubic yards per year. Over the life of the plan 560,000 cubic yards of stream gravel could be disturbed. Impacts from suction dredging are discussed in section 4.3.1.4 Impacts Common to All Alternatives.

Over 1,200 miles of stream with medium to high mineral potential and sixty-six percent of the stream miles within the entire subunit would be open to locatable minerals. Impacts to fish and aquatic resources in this alternative may be moderate with long-term (10 to 20 years) effects. This would result in decreased levels of fish populations and habitat at the local level. Based on the amount of potential disturbance, adverse impacts to fish and aquatic habitat under this alternative would be greater than under Alternatives A and B, but less than Alternative D.

Effects from Recreation Management

Impacts would be similar in type to those discussed under Common to All Alternatives. In this Alternative, the Fortymile SRMA would contain 249,000 acres and have nine management zones. This alternative allows for increased development of visitor facilities, landscape modifications, and group size as compared to Alternative B. Alternative C has greater potential impacts than Alternative B. This alternative would provide more protection to fish and aquatic habitat than Alternative A and D, but less than B. Impacts to fish and aquatic habitat are expected to be minimal under this alternative.

Effects from Travel Management

In this alternative, OHV use is restricted to existing routes (off-road travel prohibited) and to vehicles weighing 1,500 curb weight and less (same as Alternative B). In this alternative, only six percent of the subunit would be designated as Semi-Primitive which prohibits the summer use of OHVs. Alternative C would provide less protection to fish and aquatic habitat than Alternative B, but more than Alternatives D and A. Impacts to fish and aquatic habitat are expected to be minimal under this alternative.

Effects from Special Designations

The effects from the Fortymile WSR designation are similar to those in Alternative A. In addition, the Fortymile ACEC would be established for the protection of caribou and Dall sheep habitats. This ACEC would close an additional 466,000 acres to entry, location, and leasing of minerals subject to valid existing rights. Fisheries and aquatic resources within the ACEC would benefit

from mineral entry closure by limiting the adverse impacts from mining to valid and existing claims. In addition, the Plans of Operation requirement would entail the incorporation of specific fisheries rehabilitation measures. Outside of the Fortymile WSR Corridor, habitats would potentially benefit from the increased resource protection accompanying the special designation. This alternative would provide less protection to fisheries and aquatic resources than Alternative B, but more than Alternatives A and D.

4.4.1.2.4. Alternative D

Effects from Leasable Minerals

Under this alternative, 1.9 million acres would be open to fluid mineral leasing. Although lands would be open to fluid minerals (oil and gas) and solid minerals (coal) leasing, the limited potential exists for these resources within the subunit. Industry has shown no interest in leasing development in the Fortymile subunit. If leasing occurred, further NEPA analysis would be required. Based on the limited leasable mineral potential in the subunit, it is assumed that seismic surveys would not occur. Given those assumptions, impacts to fisheries and aquatic habitat would be minimal or nonexistent. This alternative has the greatest potential to impact fish and aquatic resources because it has the greatest amount of acres open to disturbance.

Effects from Locatable Minerals

Approximately 1.9 million acres would be open to locatable minerals under this alternative (Map 30). Including valid existing federal mining claims, this alternative allows for an additional 900 stream miles to be opened to locatable minerals as compared to Alternative C (Table 4.6, "Stream Miles and Acres Open to Locatable Mineral Entry, Fortymile Subunit"), none of which would be within RCAs requiring a higher standard for reclamation. Under Alternative D, fisheries and aquatic resources open to locatable mineral entry would rely on the current regulations, reclamation requirements and ROPs outlined in this plan, and mitigation measures developed during project-specific NEPA analysis.

This alternative allows for the greatest number of stream miles and acres available for locatable minerals (Table 4.6, "Stream Miles and Acres Open to Locatable Mineral Entry, Fortymile Subunit"). Of the 3,338 miles of stream open to locatable minerals, 1,440 (forty-three percent) stream miles occur within areas having medium to high mineral potential. The anticipated number of acres directly disturbed by small- and large-scale placer mines under Alternative D is estimated at up to 1,400 acres, or approximately 21 miles of stream over the life of the plan. Roughly 180 suction dredging operations are anticipated during the life of this plan. The amount of stream gravel disturbed from one suction dredging operation is estimated to be 2,000 cubic yards per year. Over the life of the plan 720,000 cubic yards of stream gravel could be disturbed.

Over 1,400 miles of stream with medium to high mineral potential and ninety percent of the stream miles within the entire subunit would be open to locatable minerals; impacts to fish and aquatic resources in this alternative may be moderate with long-term (10 to 20 years) effects. This would result in decreased levels of fish populations and habitat at local and potentially subunit levels. Based on the amount of potential disturbance, Alternative D would have the greatest potential for adverse impacts on fisheries and aquatic resources.

Effects from Recreation Management

Impacts would be similar in type to those discussed under “Common to All Alternatives.” In this alternative, the Fortymile SRMA would contain 249,000 acres and have 10 management zones. This alternative would allow for the greatest amount of visitor facility development and landscape modifications, while also authorizing the largest group size. This Alternative would provide more protection to fish and aquatic habitat than Alternative A, but less than B and C.

Effects from Travel Management

This alternative limits OHVs to 1,500 pounds curb weight and less and off-road travel would be allowed in ninety-seven percent of the subunit. Only three percent of the subunit would be designated as Semi-Primitive, which prohibits the summer use of OHVs. Trail proliferation would continue to occur with no established standards to ensure the proper construction and placement of new trails. Given the assumption of increased OHV use during the life of the plan, the unauthorized and unmanaged proliferation of trails would likely increase with a resulting increase in erosion and sediment impacts. Coupled with such a large area (ninety-seven percent of the subunit) open to off-road travel, this alternative could have minor long-term adverse impacts on fish and aquatic habitats. Alternative D has more potential to impact fish and aquatic resources than Alternatives B and C, but less than Alternative A.

Effects from Special Designations

The effects from the Fortymile WSR designation are similar to those in Alternative A, except the “scenic” segments of the river would be recommended open to locatable minerals. In addition, the Fortymile ACEC (526,000 acres) would be established for the protection of caribou and Dall sheep habitats. The “wild” segments of the Fortymile WSR Corridor would be closed to locatable mineral entry and mineral leasing subject to valid existing rights, but the remainder of the ACEC would be open to locatable mineral entry subject to the ROPs and to mineral leasing subject to minor constraints. A mining Plan of Operations would be required on any mining activity within an ACEC (43 CFR 3809.11(c)(3)). Fish and aquatic habitats benefit in areas closed to mineral entry, because the habitat generally remains intact. Fish and aquatic habitat could potentially benefit from the increased resource protection within the ACEC. This alternative would provide less protection to fish and aquatic habitat than Alternatives B and C, but more than Alternative A.

4.4.1.3. Invasive Species Fortymile Subunit

Summary of Effects

Use of BLM-managed lands consists primarily of placer and suction dredge mining, non-motorized and motorized recreation, and subsistence activities. Prevention of nonnative invasive species NIS being introduced and spread in the planning area is discussed in section 4.3.1.5 and includes outreach and education of applicants and recreational and other users. Although the introduction and spread of NIS would be reduced through mitigation, and outreach and education, effects could still occur. Plants are the nonnative invasive species most likely to be impacted and the analysis focuses on plants rather than nonnative invasive animals and pathogens.

Under all alternatives, surface-disturbing activities would increase the risk of the introduction and spread of NIP. Of the action alternatives, Alternative D would have highest potential for the introduction and spread of NIP and Alternative B would have the lowest potential. Early detection and rapid response (EDRR) and inventory and monitoring would further halt the introduction and spread of NIP.

NIP can thrive in marginal habitats, such as compacted and dry soils and those contaminated by road treatments. NIP can outcompete native vegetation at these sites and some can move into adjacent undisturbed sites, such as white sweetclover (*Melilotus officinalis* formerly *M. alba*) and orange hawkweed (*Hieracium aurantiacum*).

4.4.1.3.1. Effects Common to All Alternatives

In addition to the effects discussed as common to all subunits in section 4.3.1.5 the following effects would occur in the Fortymile Subunit.

Effects from Forest and Woodland Products

Management decisions for commercial timber sales are common to all action alternatives. No commercial timber sales would be allowed within the Fortymile WSR Corridor, the Eagle Recreation withdrawal, or the Fort Egbert Historic Site. Commercial timber sales would be considered at the project level for all remaining lands. Demand for commercial timber in the subunit has been low and is expected to continue to be low. No impacts to NIP management are expected from commercial timber sales under any alternative.

Personal use and commercial forest product use, and timber salvage sales would be considered on all other lands in the subunit. Demand for personal use and salvage timber sales has been lacking and future demand is predicted to be little to none over the life of the plan. No impacts would be anticipated from these activities. Much of the area open to authorized activities is remote and costs of getting there and getting resources to markets would be prohibitive.

Demand for commercial forest products can be fairly high in the subunit, primarily for mushrooms after wildland fire. Commercial operations move from burn to burn, across the U.S. and Canada, increasing the potential for transport of NIP, as well as other nonnative species currently not found in Alaska. Burned areas, depending on the severity of the burn, provide favorable conditions for NIP to become established. Impacts from commercial mushroom harvest would be mitigated through stipulations to the permits and through education of the applicants on NIS prevention practices.

Effects from Lands and Realty

Lands and realty actions resulting in ground disturbance, would increase the potential for NIP to become established. Vehicles and equipment used for construction and maintenance can import NIP and nonnative animals and pathogens to the disturbed area. The potential for introduction and spread of NIP from these actions would be expected to be significant. Impacts would be mitigated to the extent possible through permit stipulations and education and outreach efforts directed at applicants.

Utility corridors would be not designated under any alternative. Without corridor designations a web of rights-of-ways could be developed across the area. Corridors such as roads and trails act as conduits for the spread of NIP particularly where ground and canopy cover is removed. NIP are able to become established in marginal conditions and dominate, suppressing the growth of native vegetation.

Effects from Salable Minerals

Although management decisions for salable minerals vary slightly by alternative impacts to NIP management are not expected to vary by alternative because the demand for salable minerals from BLM lands would be very low and would not vary by alternative. The percentage of the area open to salable minerals would range from forty-seven percent in Alternative B to one-hundred percent in Alternative A.

Material sites, including gravel pits, are often infested with NIP and substantial seed banks would be available in the materials. NIP can easily spread to new areas with the contaminated mineral materials. Vehicles and equipment brought into the sites may also be contaminated with NIP seed. Gravel and other materials are generally mined from areas near the project and materials from these sites are likely to be used for road and highway maintenance along the Taylor Highway. Material sites would be inspected for NIP and seed, and treated as possible before being transported to project sites. Impacts to NIP from material sales would be mitigated as practicable through permit stipulations, outreach, and education.

Effects from Leasable Minerals

No impacts to nonnative invasive plant and animal species or pathogens would occur from leasable mineral exploration or development in the Fortymile Subunit. Due to lack of high potential oil and gas, coal, or oil shale resources on BLM lands, no activity is expected. Any exploration that might be proposed would require a permit and impacts would be mitigated through permit stipulations.

Effects from Recreation

Management of recreation areas through recreation opportunity spectrum (ROS) classes largely set the stage for the level of protection or development afforded an area. The size and location of RMZs, and therefore ROS settings, change with each alternative and are reflected in the decisions for travel management and related activities. Impacts to NIS are discussed under these other resource uses.

Effects from Travel Management

Interim alternatives for travel management for the action alternatives include a range of limits on OHV weights, permit requirements, designated trails and cross-country summer use. Limitations on OHV use would help prevent the introduction of NIP and aid EDRR efforts by concentrating use and reducing disturbance to native vegetation. Permitting use would provide opportunities to attach mitigation and to educate applicants on the threats from NIP and measures they can take to prevent spread of NIP.

In each alternative, a part or all of the BLM lands within the Fortymile Subunit would be managed as limited to vehicles 1,500 pounds curb weight and less without a permit or approved Plan of Operations. The size of the affected area varies by alternative. Within Semi-Primitive RMZs, summer use of OHVs 1,500 pounds curb weight and less would be by permit. Use of OHVs over 1,500 pounds curb weight would require a permit in all areas. New transportation and utility systems (including airstrips) and relocation of existing roads may be authorized under certain conditions in all alternatives.

Motorized boats can be used on the Fortymile WSR. EDRR, outreach, and education would help mitigate introduction and spread of NIS for uses which do not require permits.

4.4.1.3.2. Alternative A (No Action)

Effects from Lands and Realty

Right-of-way avoidance areas would not be created under Alternative A. Few rights-of-way would be anticipated under this alternative as lands would remain closed to new mineral entry.

Long-term camping (LTC) in the Fortymile WSR would be allowed in all but the “wild” segments of the river. Trampling and clearing of vegetation has occurred at long-term campsites permitted in the past and would be expected to increase if the number of active LTC permits increases. Impacts to NIP would be similar for any land disturbing action, which provide ideal seed beds for NIP to become established. Boats associated with use of the LTC could have similar impacts to those discussed as common to all subunits in section 4.3.1.5.1. Monitoring of LTC sites in all alternatives would help with early detection and rapid response to control any species during present or future management. Education and outreach efforts for LTC permit holders would help with prevention of NIP and other nonnative invasive animal and pathogen infestations.

Effects from Locatable Minerals

Under Alternative A, all BLM lands would remain closed to locatable mineral entry. Impacts to NIP would continue to occur at the current levels on valid existing mining claims. Mining results in removal of vegetation and overburden, and the potential for introduction and spread of NIP from these actions would be expected to be significant. Impacts would be mitigated as possible through permit stipulations and education and outreach efforts directed at applicants.

Effects from Travel Management

Within the Fortymile WSR Corridor, OHV use is limited to vehicles 1,500 pounds GVWR and less without a permit or approved Plan of Operations. Travel outside the corridor is not restricted and no OHV designations are in place. Potential for introduction and spread of NIP would be the greatest under Alternative A and impacts could be significant. Much of the use of motorized vehicles is recreational and as such would not require a permit, through which mitigation could be stipulated. EDRR, outreach and education, and larger scale control efforts would be used in an attempt to mitigate impacts.

4.4.1.3.3. Alternative B

Effects from Lands and Realty

Decisions in Alternative B would designate the Fortymile WSR Corridor and the Fortymile ACEC as right-of-way avoidance areas. The potential for introduction and spread of NIP would be reduced as a result. However, few rights-of-way are anticipated under this alternative. Land and realty actions would be evaluated at the project level. Impacts would be mitigated to the extent possible through permit stipulations and education and outreach efforts directed at applicants.

No LTC would be allowed on the BLM lands in the Fortymile WSR Corridor. Some impacts to NIP would continue from LTC on state land, below ordinary high water. Monitoring of LTC sites in all alternatives would help with early detection and rapid response to control any species during present or future management.

Effects from Locatable Minerals

Under Alternative B, forty-seven percent of BLM lands would be open to locatable minerals. The mineral potential is high for substantial portions of the open areas, and large- and small-scale placer development would likely occur. Extraction practices for locatable minerals result in removal of vegetation and overburden from large areas, resulting in little or no fines to hold water and nutrients. NIP tolerate marginal conditions and can more readily colonize these sites than native plants. Potential impacts to NIP management could be significant, but would be reduced by mitigation. Proposed mining operations would be analyzed for risk of NIP introduction and spread. Although stipulations on mining activity would include practices to reduce impacts from introduction and spread of NIP, some effects could still occur.

Effects from Travel Management

Alternative B offers the best protection against the introduction and spread of NIP by limiting summer use of OHVs 1,500 pounds curb weight and less on 1,459,000 acres (undesignated recreation area, Backcountry, Middlecountry, Frontcountry and Rural RMZs) to existing routes only, and requiring a permit for all but non-motorized and winter snowmobile use in the Semi-Primitive RMZs. Limiting motorized use to existing trails reduces disturbance from pioneering of new routes, which protects against pathways for new infestations. EDRR would be enhanced by concentration of OHV on trails. Where permits would be required, stipulations would reduce the threat of potential introductions of NIP. Other active management, including outreach and education at potential entry points could be used to mitigate impacts.

4.4.1.3.4. Alternative C

Effects from Lands and Realty

Long-term camping in the Fortymile WSR would have the same impacts as Alternative A.

Under Alternative C, there would be no right-of-way avoidance areas. Few rights-of-way would be anticipated under this alternative as most lands would remain closed to mineral entry. Impacts to NIS would be minimal.

Effects from Locatable Minerals

Approximately seventy percent of BLM lands would be open to locatable minerals under Alternative C. The mineral potential is high for portions of the open areas. Impacts would be much the same as Alternative B, but with more acreage vulnerable to introduction of NIP. Mitigation of impacts would be the same as for Alternative B.

Effects from Travel Management

Alternative C differs from Alternative B in the location and size of the RMZs and that off-route travel for game retrieval would be allowed on ninety-four percent of BLM lands. The remaining six percent, the Semi-Primitive RMZ, would be closed to summer OHV use. The potential for introduction and spread of NIP would increase in this alternative. Off-route travel for game retrieval would be concentrated during seasons when many of the weeds of concern will be in seed. Many of the OHV will come from outside the area, increasing the likelihood of introducing new NIP species to the area. EDRR, outreach and education, and larger scale control efforts would be used to try to mitigate impacts.

4.4.1.3.5. Alternative D

Effects from Lands and Realty

Consequences of realty actions for rights-of-way from Alternative D would be the same as Alternative A.

Long-term camping (LTC) would be allowed in all sections of the Fortymile WSR. Impacts to NIP from this management prescription would be greatest in this alternative. Trampling and clearing of vegetation would continue to occur at sites permitted in the past. The number of permitted LTCs would be expected to increase depending on the gold market, and because the “scenic” segments of the river would be opened to new locatable mineral entry under this alternative. Impacts to NIP would be similar to other land disturbing actions, which provide ideal seed beds for NIP to become established. Education and outreach efforts for LTC permit holders would help with prevention of NIP and nonnative invasive animal and pathogen infestations.

Effects from Locatable Minerals

Under Alternative D, ninety-two percent of BLM lands would be open to locatable minerals. The mineral potential is high for portions of the open areas. Impacts would be much the same as Alternative B, but with more acreage vulnerable to introduction of NIS. Mitigation of impacts would be the same as for Alternative B.

Effects from Travel Management

Alternative D differs from Alternative B in the location and size of the RMZs and that cross-country summer use of OHV 1,500 pounds curb weight and less would be allowed on ninety-seven percent of BLM lands. The Semi-Primitive RMZ (three percent) would be closed to summer OHV use. Of the action alternatives, Alternative D would have highest potential for the introduction and spread of NIP. Similar to other alternatives, EDRR, outreach and education, and control efforts would be used to try to mitigate impacts.

4.4.1.3.6. Cumulative Effects

Cumulative impacts would be similar among the alternatives but vary in extent of effect. Alternative B would contribute least to cumulative effects. Alternative D would contribute the most to cumulative effects. Alternative C would provide a balance of management of NIS while providing for multiple uses of BLM lands. Cumulative effects of Alternative A in concert with actions on other lands would be similar to D except that under Alternative A, BLM lands are closed to locatable and leasable minerals, except valid existing claims.

Demand for recreational use is anticipated to increase over the life of the plan as populations in the state increase and as technological advancements in recreation equipment occur. Placer mining is occurring on both valid federal mining claims and state mining claims in the Fortymile Subunit. Levels of placer mining would increase on BLM lands as additional lands are opened to mineral entry through Alternatives B, C, or D of this plan.

4.4.1.4. Soil and Water Resources Fortymile Subunit

Summary of Effects

As much of the Fortymile Subunit is underlain by permafrost, even relatively minor surface disturbances can lead to long-term adverse impacts to soil and water resources. A variety of decisions in the action alternatives protect soil and water resources including proposed RCAs to protect fish habitat, proposed ACECs, WSRs and RMZs, as well as weight restrictions for OHVs. However, surface disturbance associated with locatable mineral development, recreation development, and increased OHV travel activities would result in varied adverse impacts to soil and water resources.

There is a reasonable likelihood of increased development associated with locatable minerals in the Fortymile Subunit, though much of the activity may be centered in previously disturbed placer-mine areas. Generally, the potential for direct adverse impacts increases sequentially from Alternative B to Alternative C to Alternative D. The impacts associated with Alternative A vary by program, but would generally be similar to Alternative C. Appropriate stipulations and ROPs for soil and water resources would be implemented to ensure that long-term adverse impacts would be minimized or avoided.

Additional impacts beyond those discussed under 4.3.1.5.1 Effects Common to All Alternatives, are discussed in the following sections.

4.4.1.4.1. Alternative A (No Action)

Effects from Locatable Minerals

The Fortymile Subunit is closed to new locatable mineral entry. Approximately 10,000 acres of valid federal claims exist, with mining presently occurring on some of these claims. Projected locatable minerals activity for Alternative A includes six suction dredge operations per year, 27 small-scale placer mines, and two large-scale placer mines (section 4.2.1.3.4). An estimated 700 to 1,000 acres would be disturbed, with much of the disturbed areas having been previously worked by recent or historic mining operations—placer mining has occurred throughout much of the Fortymile area since the late 1800s.

It is unlikely extensive additional access roads would need to be constructed to reach known mineral deposits. Nonetheless, impacts to soil and water resources could result through increased activity on current mining claims. Impacts to soil and water resources from authorized mining operations would be reduced through site-specific analysis of subsequent authorizations.

Effects from Recreation

Under Alternative A the Fortymile WSR Corridor (249,000 acres) would continue to be managed as an SRMA. Facility enhancements such as roads, toilets, boat ramps, and parking areas, may be added to accommodate increasing recreation demand. These enhancements would likely have limited negative impacts on soil and water resources. All public lands outside of the Fortymile WSR Corridor would be managed the same as other BLM lands. Recreation user activities outside of the SRMA may have increased impacts to resources because of limited oversight. Under Alternative A, no substantial disturbance of soils or impacts to water quality would be expected unless there were a substantial increase in development or recreation use levels.

Effects from Travel Management

Travel within the Fortymile WSR Corridor would be limited to vehicles with a GVWR of no more than 1,500 pounds. The use of larger motorized vehicles within the corridor could be

permitted on a project-specific basis. Impacts to soil and water resources would vary depending on the size of vehicle, season of travel, and the number of trips; but would be mitigated through stipulations on proposed projects. Travel on BLM managed lands outside of the WSR corridor is currently unrestricted. With no OHV designation in place for lands outside of the WSR corridor, Alternative A may result in detrimental impacts to soil resources and watersheds from proliferation of user-created trails, subsequent soil erosion, and increased siltation in streams.

4.4.1.4.2. Alternative B

Effects from Locatable Minerals

Impacts to soil and water resources from locatable minerals would be greater under Alternative B than Alternative A because new areas would be opened to placer mining activity with subsequent construction of roads and/or staging areas to work selected areas. Under Alternative B, 976,000 acres of withdrawn lands would be open to locatable mineral entry. Impacts to soil and water resources from the extraction of locatable minerals would vary depending on the methods used, the size of operation and the number of mines. An estimated 10 suction dredge operations, 31 small-scale placer mines, and three large-scale placer mines would be developed within the Fortymile Subunit during the life of the plan. Each suction dredging operation would typically have a camp with a footprint of less than one acre. Impacts from suction dredge camps are anticipated to be less than 10 acres annually. Total expected surface disturbance from projected small- and large-scale placer mine operations would be 620 to 930 acres.

Placer mine operations utilizing heavy equipment have the potential to adversely impact soil resources and water quality through erosion, unintended discharge of sediment laden water, and subsequent increased downstream turbidity. Depending on the methods used and size of operation, mining operations could adversely impact the natural water quality and flow characteristics of selected river segments. Disturbance to soil and water resources from a particular mining operation would be reduced through ROPs and the site-specific analysis of subsequent authorizations.

Approximately 1,012,000 acres would be closed to locatable mineral entry, including the Fortymile WSR Corridor, the Fortymile SRMA, and the Fortymile ACEC, providing additional protection to soil and water resources in these areas.

Effects from Recreation

The Fortymile SRMA would be substantially larger (792,000 acres) than under Alternatives C and D. Most of the SRMA would be managed for Semi-Primitive and Backcountry settings (Maps 41, 42 and 43), with minimal facility development. Non-SMRA lands would be about 1,284,000 acres. Use of trails, picnic and camping areas, and facilities would likely result in moderate soil disturbance and limited impacts to water quality because these are low impact activities.

Effects from Travel Management

Alternative B would establish OHV designations and eliminate unrestricted use of OHVs. All OHVs would be restricted to curb weights of 1,500 pounds or less (including snowmobiles). No summer OHV use would be allowed within the Semi-Primitive RMZ, which includes the "wild" segments of the Fortymile WSR. Summer OHV use would be limited to existing trails in the remainder of the subunit, including portions of the WSR corridor and the Backcountry RMZ (Maps 41, 42 and 43).

No substantial adverse impacts to soil or water resources are expected under Alternative B because measures to reduce impacts to soil and water resources include trail maintenance on existing authorized trails, summer OHV use restrictions, and OHV weight restrictions.

4.4.1.4.3. Alternative C

Effects from Locatable Minerals

Under Alternative C, 1,468,000 acres would be open to locatable minerals. Placer gold potential is high for portions of the lands that would be opened and new development would likely occur in some areas. Projected locatable mineral development includes; 14 suction dredge operations, 33 small-scale placer mines, and three large-scale placer mines. Soil disturbance from suction dredge camps are anticipated to be less than 10 acres annually. Total expected surface disturbance from projected small- and large-scale placer mine operations would be 800 to 1100 acres. Impacts on soil and water resources would vary depending on the methods used, the size of operation, and the number of mines as discussed under Alternative B. Compared to Alternative B, more acres would be open to mineral development, consequently there would be greater potential for adverse impacts to soil and water resources. Based on expected area of disturbance, adverse impacts to soil and water resources, would generally be progressively greater for Alternative A, B, C, then D. Impacts would be reduced through application of ROPs and site-specific analysis of subsequent authorizations.

Effects from Recreation

Under Alternative C the Fortymile WSR Corridor (249,000 acres) would be managed as an SRMA (Maps 41, 42 and 43). Compared to Alternative B, the SRMA acreage would decrease by 543,000 acres, hence less acres would be managed to maintain Semi-Primitive or Backcountry settings. Since the area managed as an SRMA would decrease, the potential for adverse impacts to soil and water resources from recreation users would increase because of less restrictive management oversight.

Effects from Travel Management

Alternative C allows summer OHV use on more acres than Alternative B. All OHVs, including snowmobiles, would be restricted to a curb weight of 1,500 pounds or less. Summer OHV use would be limited to existing trails in about ninety percent of the subunit, including some segments of the WSR corridor and the Backcountry RMZ. Compared to Alternative B, impacts to soil and water resources would be somewhat greater for this alternative, primarily because of the increased acreage open to summer OHV use.

4.4.1.4.4. Alternative D

Effects from Locatable Minerals

Compared to other alternatives, Alternative D would likely result in the greatest disturbance to soil resources and adverse impacts to water quality. Approximately 1,920,000 acres would be open to locatable minerals. Projected development includes; 18 suction dredge operations, 40 small-scale placer mines, and three large-scale placer mines with an estimated total disturbance of 900 to 1,300 acres. Impacts to soil and water resources would vary depending on the development methods used, the size of operation and the number of mines as discussed under Alternative B. Since more

acres would be open to mineral development under Alternative D than other alternatives, there would be a greater potential for adverse impacts to soil and water resources. Impacts would be reduced through application of ROPs and site-specific analysis of subsequent authorizations.

Effects from Recreation

Effects to soil and water resources would be similar to Alternative C based on the amount of potential disturbance. Approximately 249,000 acres would be managed as SRMA and 1,827,000 acres managed as other BLM lands (Maps 41, 42 and 43).

Effects from Travel Management

Similar to Alternatives B and C, all OHVs would be restricted to a curb weight of 1,500 pounds or less including snowmobiles. However, Alternative D differs in that cross-country summer use of OHVs would be allowed on all but 54,000 acres of the Semi-Primitive Zone. Since Alternative D would increase the acreage open to summer OHV travel compared to other alternatives it would have the greatest potential for direct and indirect adverse impacts to soil and water resources associated with OHV use.

4.4.1.5. Visual Resources Fortymile Subunit

Summary of Effects

VRM Classes outline the level of change that could occur within that class. Identifying an area as a specific management class does not guarantee that change will take place. The discussion below identifies the number of acres that may retain or lose visual quality due to management in a specific VRM Class; however, the potential for every acre to lose visual quality due to management in a specific VRM Class is extremely low. The analysis logically assumes that areas designated as VRM Class III and IV objectives would permit more surface-disturbing impacts and potentially have greater adverse impacts on visual resources and scenic quality than those areas designated as VRM Class I and II objectives.

In addition to those impacts discussed under section 4.3.1.9 Impacts Common to all Subunits, the following impacts may occur in the Fortymile Subunit. The results of the Visual Resources Inventory are in Appendix D, *Visual Resource Inventory*.

Alternatives — VRM Management Class Designations		VISUAL RESOURCES INVENTORY CLASS DESIGNATION							
		VRI Class I		VRI Class II		VRI Class III		VRI Class IV	
		145,000	7%	1,878,000	90%	6,000	1%	47,000	2%
Alternative A ^a	Acres	Acres	%	Acres	%	Acres	%	Acres	%
VRM I	145,000	145,000	7						
VRM II	103,000			103,000	5				
VRM III									
VRM IV									
Total	248,000	145,000	7	103,000	5				
Alternative B	Acres	Acres	%	Acres	%	Acres	%	Acres	%
VRM I	145,000	145,000	7						
VRM II	644,000			968,000	47			3,000	<1
VRM III	4,000			3,384	<1			838	<1
VRM IV	957,000			907,000	44	6,000	<1	44,000	2
Total	2,076,000	145,000	7	1,878,000	90	6,000	<1	47,800	3
Alternative C	Acres	Acres	%	Acres	%	Acres	%	Acres	%
VRM I	145,000	145,000	7						

VRM II	452,000			452,000	22				
VRM III	0								
VRM IV	1480,000			1,426,000	69	6,000	<1	47,000	2
Total	2,076,000	145,000	7	1,878,000	91	6,000	<1	47,000	2
Alternative D	Acres	Acres	%	Acres	%	Acres	%	Acres	%
VRM I	145,000	145,000	7						
VRM II	0								
VRM III	10,000			100,000	5				
VRM IV	1,831,000			1,778,000	86	6,000	<1	47,000	2
Total	2,076,000	145,000	7	1,878,000	91	6,000	<1	47,000	2

^aOnly 12% of BLM lands have assigned VRM Classes in Alternative A. The Fortymile WSR Corridor is Class I and II.

4.4.1.5.1. Alternative A (No Action)

Under continuation of current management, visual resources would be managed on a project-specific basis, outside of the designated wild river corridor (BLM Manual 8351), as no other visual resource management classes have been established. Visual resources would be protected through the use of management class inventory objectives and the visual contrast rating process.

Effects from Cultural Resources

Impacts from stabilization and maintenance efforts on cultural sites in the Fortymile subunit have the potential to impact visual resources by removal of vegetation and excavation at each site. The browns of disturbed soils and the natural revegetation process would continue to impact color for the long-term. Texture contrasts between soils and adjacent vegetation would also be impacted long-term. Replacement of roofing or other materials on historic structures could contrast with existing color and texture by introducing new materials where weathered materials exist.

Effects from Visual Resources

Under Alternative A, of VRI Class I acres (seven percent), one-hundred percent would continue to be managed as VRM Class I resulting in preservation of the existing visual character of the designated “wild” segments of the Fortymile WSR. These lands have an A rating for scenic quality, a high sensitivity, and occur in the Foreground-Middleground Zones. Additionally, of VRI Class II lands (ninety percent), six percent would be managed as VRM Class II allowing a low level of change. These lands are the designated “scenic” and “recreational” segments of the Fortymile WSR and have an A rating for scenic quality, a high sensitivity, and occur in the Foreground-Middleground zones. The remaining ninety-four percent would remain unclassified. Less than one percent of BLM lands had a VRI Class III, while two percent had a VRI Class IV.

Effects from Travel Management

The restriction of motorized use to OHVs weighing 1,500 pounds GVWR and less without permit within the Fortymile WSR Corridor helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape. However, impacts will occur to vegetation and soils, resulting in changes to line from repeated travel or the creation of user routes. Color will change from the various hues of diverse vegetation to a more uniform grass cover or even browns of disturbed soils of from the construction of trails. Form will change by the removal of larger woody materials along the travel route and texture will change due to the removal of vegetation and the exposure of soils.

The use of larger motorized vehicles within the Fortymile WSR Corridor may be allowed under permit. The impacts from this travel would vary depending on the size of vehicle, season of travel, and the number of passes made.

Travel on other lands outside the Fortymile WSR Corridor is unrestricted and may impact visual resources by disturbing primarily vegetation by repeated passes and by clearing travel routes. These actions result in changes to color from various hues of green vegetation to a more brown color of disturbed soils. Changes in line result from clearing vegetation for easier travel resulting in a straight line instead of a predominately irregular landscape. Changes to texture occur from the removal of vegetation for travel routes, the disturbance of vegetation and resulting soils and the possible introduction of materials for surfacing hardening in an otherwise natural landscape. Unrestricted travel impacts 1,827,000 acres.

Major impacts on visual resources from new airstrips, if authorized, include changes in color, line, form and texture on the landscape. The removal of vegetation, which in turn results in soil exposure, creates a contrast between the adjacent greens of natural vegetation and the browns and grays of exposed soil and organic materials. A contrast in line occurs when the irregular characteristics of vegetation is altered by a more regular line of the airstrip. Texture characteristics change from the natural course or rough textures of diverse vegetation to the smooth uniform texture of a cleared soil area. The excavation or removal of soil to create a level landing area may impact form by creating a flat horizontal line on the landscape.

4.4.1.5.2. Alternative B

In general, Alternative B anticipates the lowest level of resource development and adopts VRM classes that would be the most restrictive to development.

Effects from Cultural Resources

Impacts from stabilization and maintenance of sites would have the same impacts as Alternative A. Impacts to visual resources from creating seven public use areas (approximately 35 acres) would include changes in vegetation through the creation of trails, picnic and camping areas associated with increased use. Changes to line, form and color would result in contrast between exposed soils and adjacent vegetation.

Effects from Fish and Aquatic Species

Under Alternative B, Sam Patch Creek (Map 6) has been identified as a High Priority Restoration Watershed and would be emphasized for restoration and/or protection. Active restoration projects, such as willow plantings, seeding and fertilizing would have positive impacts to areas with surface disturbance. Changes to line, color and texture would result in that the area would be returned to a more natural looking landscape on disturbed areas within the 29,000-acre watershed. Lands within the High Priority Restoration Watershed were inventoried as a class II and all lands will be managed as VRM Class II.

There are 11 Riparian Conservation Areas (RCAs) identified for accelerated rehabilitation of habitats which include active revegetation and streambank stabilization techniques on 205,000 acres. These activities would have a positive impact to areas with surface disturbance in returning the disturbance to a more natural looking landscape faster than natural revegetation.

Of VRI Class I lands one-hundred percent or (73,000 acres) would be managed as Class I retaining the natural appearance of the landscape. Of VRI Class II lands, eighty-eight percent or 115,000 acres would be managed as Class II while twelve percent or 16,000 acres would be managed as Class IV lands allowing a visible level of change to the landscape. Of VRI Class III lands (569 acres) one-hundred percent would be managed as Class IV lands allowing a visible level of change to the landscape. Of VRI Class IV lands one-hundred percent (150 acres) would be managed as Class III lands allowing some preservation of the existing visual character of these lands.

Effects from Visual Resources

Under Alternative B, of VRI Class I, 144,000 acres (seven percent), one-hundred percent would continue to be managed as VRM Class I resulting in preservation of the existing visual character of the designated “wild” segments of the Fortymile WSR. These lands have an A rating for scenic quality, a high sensitivity and occur in the Foreground-Middleground Zones. This is the same as Alternative A.

Of VRI Class II lands (ninety percent or 1,878,000 acres), fifty-one percent (968,000 acres) would be managed as VRM Class II allowing a low level of change. These lands include the designated “scenic” segments of the Fortymile WSR and other lands within the Fortymile SRMA, having an A rating for scenic quality, a high sensitivity, and occurring in the Foreground-Middleground Zones. Less than one percent (3000 acres) of VRI Class II lands would be managed as VRM Class III including “recreational” segments of the Fortymile WSR, potentially resulting in only partially retention of landscape characteristics, while forty-eight percent (907,000 acres) of VRI Class II lands would be managed as VRM Class IV, potentially resulting in a high level of change to the characteristic landscape. These lands are outside the Fortymile SRMA, have high and medium sensitivity, and occur in all three distance zones.

Less than one percent of BLM lands had a VRI Class III (6,000 acres) and one-hundred percent of these lands would be managed as VRM Class IV, potentially resulting in a high level of change to the landscape characteristics. Many of these lands are located outside the Fortymile SRMA.

Only two percent of BLM lands had a VRI Class IV (47,000 acres). Of VRI Class IV lands five percent or 3000 acres would be managed as VRM Class II allowing a low level of change to the characteristic landscape. These acres are associated with the Fortymile SRMA. Approximately two percent (838 acres) would be managed as VRM Class III potentially resulting on only partially retention of the characteristic landscape. These acres are also associated with the Fortymile SRMA. The remaining ninety-three percent (44,000 acres) would be managed as VRM Class IV potentially resulting on a high level of change to the characteristic landscape. These VRM Class IV lands are located outside the Fortymile SRMA.

Using design fundamentals of proper siting and location, reducing unnecessary disturbance, and by repeating the landscape elements of form, line, color and texture for all surface-disturbing activities can contribute significantly in reducing impacts to visual resources regardless of VRM Class.

Effects from Wilderness Characteristics

Under Alternative B, wilderness characteristics will be maintained on 994,000 acres (forty-nine percent), including lands within the Fortymile ACEC and Fortymile WSR segments that do not contain mining claims, including limiting activities that impact the appearance of naturalness.

Of VRI Class I lands (122,000 acres) one-hundred percent would be managed as class II allowing a low level of change to the landscape. Of VRI Class II lands, one-hundred percent or 870,000 acres would be managed as Class II. No lands were identified as VRI Class III lands. Of VRI Class IV lands one-hundred percent (3,000 acres) would be managed as Class II lands resulting in preservation of the existing visual character of these lands.

Effects from Forest and Woodland Products

Under Alternative B personal use of timber, timber salvage sales, commercial timber sales, and commercial use of forest products (e.g., mushrooms, berries) would not be authorized within the Fortymile WSR Corridor, the Eagle Recreational withdrawal, and the Fort Egbert Historic Site. Temporary camps and various impacts from different harvest techniques would not impact 249,000 acres. These management actions would help protect visual resources.

These activities would be considered on the remainder of the subunit, 1,827,000 acres. Temporary camps and various impacts from different harvest techniques could occur on these lands. Timber and firewood harvest activities can primarily impact line, form, color, and texture. The size and scope of impacts would depend on the size of the area and harvest techniques used. Few timber sales are anticipated during the life of the plan due to limited access and lack of commercially valuable timber. Impacts from timber and forest product harvest are discussed in section 4.3.1.9 Effects Common to All Subunits.

Effects from Land and Realty

Under Alternative B, long-term camping for commercial purposes (i.e., camping in association with mining on state mining claims adjacent to BLM lands) in the “wild,” “scenic,” or “recreational” segments of the Fortymile WSR Corridor would not be allowed on BLM-managed lands, but could occur below ordinary high-water on state lands. Visual impacts to line, color and texture from temporary long-term camps, generally less than one acre in size, would no longer occur on approximately 248,000 acres.

Within the Fortymile WSR Corridor and the Fortymile ACEC, rights-of-way would generally not occur if other suitable locations are available. This would protect visual resources by not allowing clearance of vegetation and structures associated with different kinds of rights-of-way activities, maintain a natural landscape in line, form, color and texture on approximately 924,000 acres.

Effects from Fluid Leasable Minerals

Approximately 1,100,000 acres would be closed to fluid leasable minerals, including the Fortymile WSR Corridor, the Fortymile SRMA, the Fortymile ACEC, mineral licks, all disposal lands, BLM Administrative sites, and the Fort Egbert and Eagle recreation withdrawals. In addition 2,000 acres of split-estate lands would be open to fluid mineral leasing subject to major constraints such as no surface occupancy. These actions would protect visual resources.

Approximately 974,000 acres would be open to leasing. If exploration occurred, which is not anticipated, it could result in impacts such as green trails and the removal of vegetation in straight lines causing changes to color, line and texture.

No lands were identified as VRI Class I lands. Of VRI Class II lands, one percent or 13,000 acres would be managed as Class II, while ninety-nine percent (892,000 acres) would be managed as Class IV lands allowing a visible level of change to the landscape. Of VRI Class III lands, one-hundred percent or 4,000 acres would be managed as Class IV lands allowing a visible level

of change to the landscape. Of VRI Class IV lands, one-hundred percent or 43,000 acres would be managed as Class IV lands allowing a visible level of change to the landscape.

Effects from Solid Leasable Minerals

Approximately 1,100,000 acres would be closed to solid leasable minerals, including the same areas described as closed under Fluid Leasable Minerals above. Visual resources would not be impacted by mining solid leasable minerals on these lands.

Impacts to visual resources by exploration, development and production of solid leasable mineral resources on the remaining 976,000 acres would depend on the scale of the action and the number of mineral sites mined. However, it is assumed that no solid mineral exploration, leasing, or development would occur during the life of the plan.

Effects from Locatable Minerals

Under Alternative B, 1,100,000 acres would be closed to locatable mineral entry, including the Fortymile WSR Corridor, the Fortymile SRMA, the Fortymile ACEC, mineral licks, all disposal lands, BLM Administrative sites, and the Fort Egbert and Eagle recreation withdrawals. Visual resources would not be impacted by mining locatable minerals on these lands.

Approximately 976,000 acres would be open to mineral entry. The impacts from the extraction of locatable minerals would vary depending on the methods used, the size of operation and the number of mines.

Large-scale placer mining (semi-mobile plant) operations would impact visual resources through changes to line, form, color, and texture from mined areas and related facilities. It is anticipated that the subunit would have up to three large-scale placer mine operations. Each operation would have a disturbed annual footprint of approximately 36 acres over the life of the mine which is anticipated to be between 10 to 20 years for a total of 60 to 80 acres of disturbance. Impacts from all three operations would impact between 180 to 240 acres over the life of this plan.

The subunit is anticipated to have up to 31 small-scale placer mine operations. Operations would impact visual resources through changes to line, form, color, and texture from mined areas and related facilities. Each operation would have a disturbed annual footprint of 4.4 acres over the life of the mine which is anticipated to be between 10 to 20 years for a total of 20 to 30 acres of disturbance. Impacts from all 34 operations would impact between 620 to 930 acres over the life of this plan.

Approximately 10 suction dredge operations are anticipated to occur in this subunit. Each operation would have a camp with a footprint of less than one acre over the life of the mine which is anticipated to be between 10 to 20 years. The movement of materials occurs underwater and thus does not have a noticeable impact to visual resources and is generally redistributed each spring during break-up or high water events. Impacts from suction dredge camps are anticipated to be less than 10 acres annually over the life of this plan.

Mineral Exploration activities with resulting camp and field sampling would impact visual resources on between six to 104 acres annually. Reclamation would generally occur annually with the only impacts to visual resources from camps. Up to two exploration operations may occur over the life of this plan.

No lands were identified as VRI Class I lands. Of VRI Class II lands, one percent or 13,000 acres would be managed as Class II, while ninety-nine percent (892,000 acres) would be managed as Class IV lands allowing a visible level of change to the landscape. Of VRI Class III lands, one-hundred percent or 4,000 acres would be managed as Class IV lands allowing a visible level of change to the landscape. Of VRI Class IV lands, one-hundred percent or 43,000 acres would be managed as Class IV lands allowing a visible level of change to the landscape.

Effects from Salable Minerals

Approximately 246,000 acres would be closed to salable minerals, including “wild” and “scenic” segments of the Fortymile WSR Corridor and a one mile radius around mineral licks. Visual resources would not be impacted by mineral material sales in these areas.

The remaining 1,830,000 acres would be open. The impacts from the extraction of salable minerals would vary depending on the methods used and size of operation. Large mining operations would have the greatest impact to visual resources impacting line, form, color, and texture of mined areas, with the removal of vegetative cover and stockpiled materials creating form contrast between the mined areas and the stockpiled materials and the background landforms. Mining and material stockpiles would also create color contrast between the greens of vegetation and the browns of soils. Texture would change from a natural medium, subtle texture of vegetation to a coarse, rough contrast of disrupted soils and organic materials. Changes in line from the irregular, weak line of the natural landscape to a regular, strong line between natural vegetation and disturbed landscape could occur.

While most of the subunit is open to salable minerals it is anticipated that only 200 acres would be mined within the planning area and of that 200, approximately 100 acres would be mined within this subunit. Mining activities for salable minerals would generally occur along roads due to transportation requirements.

Effects from Recreation

Recreation Management Zones are managed for different physical settings which include remoteness, naturalness and visitor facilities. Of these, naturalness and visitor facilities impact visual resources by setting prescriptions for management, i.e., describing the amount of naturalness and how facilities will sit on the landscape. These prescriptions provide a range from Primitive, Semi-Primitive, Backcountry, Middlecountry, Frontcountry, Rural and Urban, each with different levels of naturalness and description of how facilities will sit on the landscape

Of VRI Class I lands (145,000 acres) less than one percent would be managed as Class II allowing a low level of change to the landscape while all other VRI Class I would be managed as Class I. Of VRI Class II lands (644,000 acres) less than one percent would be managed as Class III allowing some level of change to the landscape while other VRI Class II would be managed as Class II. No lands were identified as VRI Class III lands. Of VRI Class IV lands (3,000 acres), eighty-five percent would be managed as Class II lands resulting in preservation of the existing visual character of these lands while twenty-four percent (837 acres) would be managed as Class III lands resulting in some preservation of the existing visual character of these lands.

Under this alternative areas classed Semi-Primitive and associated with the wild river corridor would be managed as VRM Class I (144,000 acres). Semi-Primitive, but not associated with the wild river corridor and Backcountry Recreation Management Zones (RMZ) would have a VRM

Class II (644,000 acres), Middlecountry, Frontcountry, and Rural RMZs would have a VRM Class III (4,000 acres), and all other BLM lands would have a VRM Class IV (1,284,000 acres).

Effects from Travel Management

Travel management for other BLM Lands outside the SRMA

The restriction of winter motorized use to OHVs weighing 1,000 pounds curb weight and less helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape on approximately 1,284,000 acres. The season of travel and weight restriction helps reduce the amount of surface disturbance to vegetation and soils, even with cross-country travel allowed, because of the frozen soils and snow cover on lower growing vegetation.

Summer travel by OHVs weighing 1,500 pounds curb weight and less are allowed on existing routes only. This helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape because travel is limited to hardened existing routes. Repeated OHV use leads to destruction of vegetation, which in turn results in soil exposure, creating a contrast between the adjacent greens of natural vegetation and the browns and grays of exposed soil and organic materials. A contrast in line occurs when the irregular characteristics of vegetation is altered by a more regular line in the form of a developed route or constructed trail. Texture characteristics change from the natural course or rough textures of diverse vegetation to the smooth uniform texture of a developed trail, trail hardening techniques or mineral soil area. These management activities help protect the visual resources on 1,284,000 acres.

The use of larger vehicles could be allowed by permit. The impacts larger vehicles would vary depending on the size of vehicle, season of travel, and the number of passes made. They would be similar to impacts described under section 4.3.1.9 Effects Common to All Subunits, Visual Resources except on a larger scale.

Travel management within the SRMA

Common to All Zones

The restriction of winter motorized use to OHVs weighing 1,000 pounds curb weight and less without permit would help reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape. The season of travel and weight restriction helps reduce the amount of surface disturbance to vegetation and soils even with cross-country travel allowed because of the frozen soils and snow cover on lower growing vegetation.

Semi-Primitive Zones

The restriction of summer motorized use to OHVs weighing 1,500 pounds curb weight and less within the Semi-Primitive RMZs (includes the “wild” segments of the Fortymile WSR) to permit would help reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape to 617,000 acres.

All Other Zones

The Backcountry, Middlecountry, Frontcountry, Rural Zones (including the “scenic” and “recreational” segments of the Fortymile WSR) would limit summer motorized use to OHV weighing 1,500 pounds and less curb weight on existing routes only. This would help reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape to 175,000 acres.

All other vehicle use would be by permit within the entire SRMA. The impacts larger vehicles would vary depending on the size of vehicle, season of travel, and the number of passes made. They would be similar to impacts described under Common to All Travel Management except on a larger scale.

Effects from Special Designations

Under Alternative B, 732,000 acres would be designated as the Fortymile ACEC to protect habitat for the Fortymile caribou herd and Dall sheep habitat. The entire ACEC will remain closed to entry, location, and leasing of minerals subject to valid existing rights. Management decisions to protect wildlife habitat helps to preserve the visual character of the area.

Of VRI Class I lands (55,000 acres) one-hundred percent would be managed as Class I. Of VRI Class II lands ninety-nine percent or 675,000 acres would be managed as Class II, while one percent (4,000 acres) would be managed as Class IV allowing visible change to the landscape. No lands were identified as VRI Class III lands. Of VRI Class IV lands one-hundred percent (2,000 acres) would be managed as Class II lands resulting in preservation of the existing visual character of these lands.

Approximately 1,300 acres associated with Gold Run would be maintained as a natural landscape under the eligibility as a “wild” river and would be assigned a VRM Class I. Approximately 1,300 acres associated with Dome Creek would be maintained as a natural landscape under the eligibility as a “recreational” river and would be assigned a VRM Class III. “Wild” are essentially primitive and undeveloped. “Recreational” rivers are readily accessible and may have some development along their shorelines. Management decisions to preserve these characteristics help to preserve the visual resources of the area by limiting surface-disturbing activities and maintaining natural vegetation and landform on a scale of development from “wild” to “recreational.”

4.4.1.5.3. Alternative C

In general, Alternative C anticipates a moderate level of resource protection, use and enhancement of resources and adopts VRM classes that would allow a range of development and still protect visual resource in certain areas.

Effects from Cultural Resources

Same as Alternative B.

Effects from Fish and Aquatic Species

Same as Alternative B, Sam Patch Creek (Map 6) has been identified as a High Priority Restoration Watershed and would be emphasized for restoration and/or protection. Active restoration projects, such as willow plantings, seeding and fertilizing would have positive impacts to areas with surface disturbance. Changes to line, color and texture would result in that the area would be returned to a more natural looking landscape on any disturbed areas within the 29,000-acre watershed.

Of VRI Class II lands, twenty-eight percent or 8,000 acres would be managed as Class II while seventy-two percent or 21,000 acres would be managed as Class IV lands. No lands were identified as VRI Class I, III or IV lands.

There is one RCA identified for accelerated rehabilitation of habitats which include active revegetation and streambank stabilization techniques on 569 acres. These activities would have a positive impact to areas with surface disturbance in returning the disturbance to a more natural looking landscape faster than natural revegetation. Of VRI Class III lands one-hundred percent would be managed as Class IV allowing a visible level of change to the landscape. No lands were identified as VRI Class I, II or IV lands.

Effects from Visual Resources

Under Alternative C, all VRI Class I, 144,000 acres (seven percent), one-hundred percent would continue to be managed as VRM Class I resulting in preservation of the existing visual character of the designated “wild” segments of the Fortymile WSR. These lands have an A rating for scenic quality, a high sensitivity, and occur in the Foreground-Middleground Zones. This is the same as Alternatives A and B.

Of VRI Class II lands (ninety percent or 1,878,000 acres), twenty-four percent (452,000 acres) would be managed as VRM Class II allowing a low level of change. These lands are designated “scenic” segments of the Fortymile WSR, having an A rating for scenic quality, a high sensitivity, and occurring in the Foreground-Middleground Zones. Approximately seventy-six percent (1,426,000 acres) of VRI Class II lands would be managed as VRM Class IV, potentially resulting in a high level of change to the characteristic landscape. These lands include the “recreational” segments of the Fortymile WSR and all lands outside the Fortymile SRMA and have an A rating for scenic quality, both high and medium sensitivity and occur in all three distance zones.

Less than one percent of BLM lands had a VRI Class III (6000 acres) and one-hundred percent of these lands would be managed as VRM Class IV, potentially resulting in a high level of change to the landscape characteristics. Most of these lands are located outside the Fortymile SRMA.

Only two percent of BLM lands had a VRI Class IV (47,000 acres) and one-hundred percent of these lands would be managed as VRM Class IV potentially resulting on a high level of change to the characteristic landscape. These VRM Class IV lands are located outside the Fortymile SRMA.

Using design fundamentals of proper siting and location, reducing unnecessary disturbance, and by repeating the landscape elements of form, line, color and texture for all surface-disturbing activities can contribute significantly in reducing impacts to visual resources, regardless of VRM Class.

Effects from Wilderness Characteristics

Under Alternative C, wilderness characteristics would be maintained on 487,000 acres (twenty-four percent) within some sections of “wild” segments of the Fortymile WSR. Activities that impact the appearance of naturalness would be limited.

Of VRI Class I lands (122,000 acres) one-hundred percent would be managed as Class I retaining the natural appearance of the landscape. Of VRI Class II lands, one-hundred percent or 365,000 acres would be managed as Class II. No lands were identified as VRI Class III or IV lands.

Effects from Forest and Woodland Products

Under Alternative C, personal use of timber and commercial use of forest products would not be authorized within “wild” segments of the Fortymile WSR Corridor, the Eagle Recreational withdrawal, and the Fort Egbert Historic Site. Temporary camps and various impacts from different harvest techniques would not impact 146,000 acres. These management actions would help protect visual resources.

Timber salvage sales would be considered throughout the subunit (2,077,000 acres). The size and scope of impacts would depend on the size of the area and harvest techniques used. Temporary camps and various impacts from different harvest techniques could occur on these lands.

Commercial timber sales would not be allowed within the Fortymile WSR Corridor, the Eagle Recreation withdrawal, and Fort Egbert Historic Site. This would protect approximately 249,000 acres from associated impacts from commercial harvest of timber. Commercial timber sales would be allowed on all other BLM lands (1,827,000 acres). Timber and firewood harvest activities can primarily impact line, form, color, and texture. The size and scope of impacts would depend on the size of the area and harvest techniques used. Few timber sales are anticipated during the life of the plan due to limited access and lack of commercially valuable timber. Impacts from timber and forest product harvest are discussed in section 4.3.1.9 Effects Common to All Subunits.

Effects from Lands and Realty

Under Alternative C, long-term camping for commercial purposes (i.e., camping in association with mining on state mining claims adjacent to BLM lands) would be allowed in “scenic” and “recreational” segments of the Fortymile WSR Corridor. Visual impacts to line, color and texture from temporary long-term camps, generally less than one acre in size, would occur. Color would be the greatest impact. Impacts would be the same as Alternative A.

Effects from Fluid Leasable Minerals

Approximately 608,000 acres would be closed to fluid leasable minerals, including the Fortymile WSR Corridor, the Fortymile SRMA, core caribou habitat within the Fortymile ACEC, all disposal lands, BLM Administrative sites, and the Fort Egbert and Eagle recreation withdrawals. Approximately 157,000 acres would be open to fluid mineral leasing subject to minor constraints. These actions would protect visual resources.

Approximately 1,468,000 acres would be open to leasing and exploration, of this 157,000 acres within the Fortymile ACEC would be subject to minor constraints, such as seasonal closures. Minor constraints would protect visual resources by limiting surface disturbance activities associated with fluid minerals at least seasonally. If exploration occurred, it would result in impacts such as green trails and the removal of vegetation in straight lines causing changes to color, line and texture. However, no leasing or exploration is anticipated over the life of the plan.

No lands were identified as VRI Class I lands. Of VRI Class II lands, less than one percent or 14 acres would be managed as Class II, ninety-nine percent or 1,254,000 acres would be managed as Class IV lands while eleven percent (157,000 acres) would be managed as Class IV lands allowing a visible level of change to the landscape with minor constraints. Of VRI Class III lands, one-hundred percent or 4,000 acres would be managed as Class IV lands allowing a visible level of change to the landscape. Of VRI Class IV lands, one-hundred percent or 46,000 acres would be managed as Class IV lands allowing a visible level of change to the landscape.

Effects from Solid Leasable Minerals

Approximately 608,000 acres in the same areas described as closed to fluid leasable minerals (above) would also be closed to solid leasable minerals. Visual resources would not be impacted by mining solid leasable minerals on these lands. Impacts to visual resources by exploration, development and production of solid leasable mineral resources on the remaining approximately 1,311,000 acres would depend on the scale of the action and the number of mineral sites mined. However, no leasing or exploration is anticipated over the life of the plan.

Effects from Locatable Minerals

Approximately 608,000 acres would be closed to locatable mineral entry, including the Fortymile WSR Corridor, the Fortymile SRMA, core caribou habitat within the Fortymile ACEC, mineral licks, all disposal lands, BLM Administrative sites, and the Fort Egbert and Eagle recreation withdrawals. Visual resources would not be impacted by mining locatable minerals on these lands.

Approximately 1,469,000 acres would be open for mining. The impacts from the extraction of locatable minerals would vary depending on the methods used, the size of operation and the number of mines.

Large-scale placer mining (semi-mobile plant) operations would impact visual resources through changes to line, form, color, and texture from mined areas and related facilities. It is anticipated that the subunit would have up to three large-scale placer mine operations. Each operation would have a disturbed annual footprint of approximately 36 acres over the life of the mine which is anticipated to be between 10 to 20 years for a total of 60 to 80 acres of disturbance. Impacts from all three operations would impact between 180 to 240 acres over the life of this plan.

The subunit is anticipated to have up to 33 small-scale placer mine operations. Operations would impact visual resources through changes to line, form, color, and texture from mined areas and related facilities. Each operation would have a disturbed annual footprint of 4.4 acres over the life of the mine which is anticipated to be between 10 to 20 years for a total of 20 to 30 acres of disturbance. Impacts from all 34 operations would impact between 660 to 990 acres over the life of this plan.

Approximately 14 suction dredge operations are anticipated to occur in this subunit. Each operation would have a camp with a footprint of less than one acre over the life of the mine which is anticipated to be between 10 to 20 years. The movement of materials occurs underwater and thus does not have a noticeable impact to visual resources and is generally redistributed each spring during break-up or high water events. Impacts from suction dredge camps are anticipated to be less than 14 acres annually over the life of this plan.

Mineral exploration activities with resulting camp and field sampling would impact visual resources on between six and 156 acres annually. Reclamation would generally occur annually with the only impacts to visual resources from camps. Up to three exploration operations may occur over the life of this plan.

No lands were identified as VRI Class I lands. Of VRI Class II lands, less than one percent or 14 acres would be managed as Class II, ninety-nine percent or 1,411,000 acres would be managed as Class IV lands allowing a visible level of change to the landscape. Of VRI Class III lands, one-hundred percent or 4,000 acres would be managed as Class IV lands allowing a visible level of change to the landscape. Of VRI Class IV lands, one-hundred percent or 46,000 acres would be managed as Class IV lands allowing a visible level of change to the landscape.

Effects from Salable Minerals

Impacts would be the same as Alternative B.

Effects from Recreation

Recreation Management Zones are managed for different physical settings which include remoteness, naturalness and visitor facilities. Of these, naturalness and visitor facilities impact visual resources by setting prescriptions for management, i.e., describing the amount of naturalness and how facilities will sit on the landscape. These prescriptions provide a range from Primitive, Semi-Primitive, Backcountry, Middlecountry, Frontcountry, Rural and Urban, each with different levels of naturalness and description of how facilities will sit on the landscape

Of VRI Class I lands (144,000 acres) one-hundred percent would be managed as Class I. Of VRI Class II lands (104,000 acres), three percent (4,000 acres) would be managed as Class IV allowing a visible level of change to the landscape while ninety-seven percent or (100,000 acres) of VRI Class II would be managed as Class II. No lands were identified as VRI Class III lands. Of VRI Class IV lands (838 acres), one-hundred percent would be managed as Class IV.

The assignment of VRM Classes would be guided by BLM policy and guidance for designated Wild and Scenic Rivers in that, “wild” segments would be managed as VRM Class I (144,000 acres) while “scenic” segments would be managed as VRM Class II (100,000 acres). Recreation river segments (4,000 acres) and the remainder of the subunit (1,827,000 acres) would be managed as VRM Class IV. Some Recreation Management Zones will have different VRM classes due to the designation of the Wild and Scenic River segment.

Effects from Travel Management

Travel management for other BLM Lands outside the SRMA

The restriction of winter motorized use to OHVs weighing 1,000 pounds curb weight and less without permit would help reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape on approximately 1,827,000 acres. The season of travel and weight restriction helps reduce the amount of surface disturbance to vegetation and soils even with cross-country travel allowed because of the frozen soils and snow cover on lower growing vegetation. This is the same as Alternative B.

Summer travel by OHVs weighing 1,500 pounds curb weight and less are allowed on existing routes only. Travel off existing routes will be allowed to retrieve legally harvested game. This helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape because travel is limited to hardened existing routes except for game retrieval. Multiple passes over the same travel route for the retrieval of game could cause changes in color, line, and texture on the landscape. Repeated OHV use leads to destruction of vegetation, which in turn results in soil exposure, creating a contrast between the adjacent greens of natural vegetation and the browns and grays of exposed soil and organic materials. A contrast in line occurs when the irregular characteristics of vegetation is altered by a more regular line in the form of a developed route or constructed trail. Texture characteristics change from the natural course or rough textures of diverse vegetation to the smooth uniform texture of a developed trail, trail hardening techniques or mineral soil area. These management activities help protect the visual resources on 1,827,000 acres.

All other vehicle use would be by permit only on other BLM lands. The impacts larger vehicles would vary depending on the size of vehicle, season of travel, and the number of passes made. They would be similar to impacts described under open Cross-Country Travel except on a larger scale.

Travel management within the SRMA

Common to All Zones

The restriction of motorized use to OHVs weighing 1,000 pounds curb weight and less without permit to winter use would help reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape on approximately 249,000 acres. The season of travel and weight restriction helps reduce the amount of surface disturbance to vegetation and soils even with cross-country travel allowed because of the frozen soils and snow cover on lower growing vegetation. This is the same as Alternative B.

Semi-Primitive Zones

Requiring a permit for summer motorized use within the Semi-Primitive RMZs (including the “wild” segments of the Fortymile WSR) would help reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape to 121,000 acres.

All Other Zones

The Backcountry, Middlecountry, Frontcountry, Rural Zones (including the “scenic” and “recreational” segments of the Fortymile WSR) would allow summer travel by OHVs weighing 1,500 pounds curb weight and less are allowed on existing routes only. Travel off existing routes will be allowed to retrieve legally harvested game. This helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape because travel is limited to hardened existing routes except for game retrieval. Multiple passes over the same travel route for the retrieval of game could cause changes in color, line, and texture on the landscape. Repeated OHV use leads to destruction of vegetation, which in turn results in soil exposure, creating a contrast between the adjacent greens of natural vegetation and the browns and grays of exposed soil and organic materials. A contrast in line occurs when the irregular characteristics of vegetation is altered by a more regular line in the form of a developed route or constructed trail. Texture characteristics change from the natural course or rough textures of diverse vegetation to the smooth uniform texture of a developed trail, trail hardening techniques or mineral soil area. These management activities help protect the visual resources on 121,000 acres.

All other vehicle use may be allowed under permit on 212,000 acres. The impacts larger vehicles would vary depending on the size of vehicle, season of travel, and the number of passes made. They would be similar to impacts described under Common to All Travel Management except on a larger scale. This is the same as Alternative B.

Effects from Special Designations

Under Alternative C, 547,000 acres would be designated as the Fortymile ACEC to protect habitat for the Fortymile caribou herd and Dall sheep. Only 360,000 acres of the ACEC will remain closed to entry, location, and leasing of minerals subject to valid existing rights. Management decisions to protect wildlife habitat helps to preserve the visual character of the area.

Of VRI Class I lands (38,000 acres) one-hundred percent would be managed as Class I. Of VRI Class II lands (509,000 acres) sixty-nine percent or 352,000 acres would be managed as Class II while thirty-one percent or 157,000 acres would be managed as Class IV allowing a visible level of change to the landscape. No lands were identified as VRI Class III lands. Of VRI Class IV lands one-hundred percent (12 acres) would be managed as Class IV lands.

4.4.1.5.4. Alternative D

In general, this alternative anticipates the greatest amount of resource development and adopts the least restrictive VRM classes that would allow major development while protecting visual resource in certain areas. Additional impacts beyond those discussed under common to all are discussed below.

Effects from Cultural Resources

Same as Alternative B.

Effects from Fish and Aquatic Species

Under Alternative D, Sam Patch Creek (Map 7) has been identified as a High Priority Restoration Watershed and would be emphasized for restoration and/or protection. Active restoration projects, such as willow plantings, seeding and fertilizing would have positive impacts to areas with surface disturbance. Changes to line, color and texture would result in that the area would be returned to a more natural looking landscape on approximately 29,000 acres. Of VRI Class II lands, twenty-eight percent or 8,000 acres would be managed as Class III allowing some change to the natural landscape, while seventy-two percent or 21,000 acres would be managed as Class IV lands allowing a visible level of change to the landscape. No lands were inventoried as Class III or Class IV lands.

Effects from Visual Resources

Under Alternative D, all VRI Class I 144,000 acres (seven percent), one-hundred percent would continue to be managed as VRM Class I resulting in preservation of the existing visual character of the designated "wild" segments of the Fortymile WSR. These lands have an A rating for scenic quality, a high sensitivity and occur in the Foreground-Middleground Zones. This is the same as Alternatives A and B.

Of VRI Class II lands (ninety percent or 1,878,000 acres), five percent or 100,000 acres would be managed as VRM Class III potentially resulting in only a partial retention of landscape characteristics. These lands are designated "scenic" segments of the Fortymile WSR, having an A rating for scenic quality, a high sensitivity, and occurring in the foreground-middle ground zones. Approximately ninety-five percent (1,778,000 acres) of VRI Class II lands would be managed as VRM Class IV, potentially resulting in a high level of change to the characteristic landscape. These lands include the "recreational" segments of the Fortymile WSR and all lands outside the Fortymile SRMA and have an A rating for scenic quality, both high and medium sensitivity and occur in all three distance zones.

Less than one percent of BLM lands had a VRI Class III (6,000 acres), and one-hundred percent of these lands would be managed as VRM Class IV, potentially resulting in a high level of change to the landscape characteristics. Most of these lands are located outside the Fortymile SRMA.

Only two percent of BLM lands had a VRI Class IV (47,000 acres), and one-hundred percent of these lands would be managed as VRM Class IV potentially resulting on a high level of change to the characteristic landscape. These VRM Class IV lands are located outside the Fortymile SRMA.

Using design fundamentals of proper siting and location, reducing unnecessary disturbance, and by repeating the landscape elements of form, line, color and texture for all surface-disturbing activities can contribute significantly in reducing impacts to visual resources, regardless of VRM Class.

Effects from Wilderness Characteristics

Under Alternative D, wilderness characteristics would be maintained on 54,000 acres (three percent) within the Middle Fork of the Fortymile WSR. Activities that impact the appearance of naturalness would be limited.

Of VRI Class I lands (54,000 acres) one-hundred percent would be managed as class I. No lands were identified as VRI Class II, III or IV lands.

Effects from Forest and Woodland Products

Under Alternative D, personal use of timber would not be authorized within the Eagle Recreational withdrawal and the Fort Egbert Historic Site. Temporary camps and various impacts from different harvest techniques would not impact 850 acres in these areas.

Commercial use of forest products would not be allowed within the Fort Egbert Historic Site. This would protect approximately 13 acres from impacts associated with commercial use of forest products.

Impacts from timber salvage and commercial timber sales would be the same as Alternative C.

Effects from Lands and Realty

Under Alternative D, long-term camping for commercial purposes (i.e., camping in association with mining on state mining claims adjacent to BLM lands) would be allowed in “wild,” “scenic,” and “recreational” segments of the Fortymile WSR Corridor. Visual impacts to line, color and texture from temporary long-term camps, generally less than one acre in size, would occur along all segments of the Fortymile WSR potentially impacting 248,000 acres.

PLO 3432 on Eagle Recreation Site would be revoked. This revocation would allow 816 acres to be transferred out of BLM management and open for development and associated surface disturbance activities.

Effects from Fluid Leasable Minerals

Approximately 158,000 acres would be closed to fluid leasable minerals, including “wild” and “recreational” segments of the Fortymile WSR, all disposal lands, BLM Administrative sites, the Fort Egbert and Eagle recreation withdrawals, and within one-half mile radius of mineral licks. These actions would protect visual resources in these areas. Approximately 507,000 acres in the Fortymile ACEC would be open to fluid mineral leasing subject to minor constraints such as seasonal closures. These actions would protect visual resources by limiting surface disturbance activities associated with fluid minerals at least seasonally.

An additional 1,411,000 acres would be open to leasing and exploration subject to standard stipulations. If exploration occurred, impacts from those activities would occur, such as green trails and the removal of vegetation in straight lines causing changes to color, line and texture. However, no fluid mineral exploration or leasing is anticipated in the Fortymile Subunit during the life of the plan.

No lands were identified as VRI Class I lands. Of VRI Class II lands seven percent (98,000 acres) would be managed under Class III retaining the natural appearance of the landscape while ninety-three percent (1,256,000 acres) would be managed as Class IV lands allowing a visible level of change to the landscape with 507,000 acres managed as Class IV lands with minor constraints. Of VRI Class III lands, one-hundred percent or 4,000 acres would be managed as Class IV lands allowing a visible level of change to the landscape. Of VRI Class IV lands, one-hundred percent or 46,000 acres would be managed as Class IV lands allowing a visible level of change to the landscape.

Effects from Solid Leasable Minerals

Approximately 158,000 acres in the same areas described as closed to fluid leasable minerals (above) would also be closed to solid leasable minerals. Visual resources would not be impacted by mining solid leasable minerals on these lands.

Impacts to visual resources by exploration, development and production of solid leasable mineral resources on the remaining 1,411,000 acres would depend on the scale of the action and the number of mineral sites mined. However, no exploration or development of solid leasable minerals is anticipated during the life of the plan due to the low occurrence potential for these types of minerals in the subunit.

Effects from Locatable Minerals

Approximately 156,000 acres would be closed to locatable mineral entry, including "wild" segments of the Fortymile WSR Corridor, portions of the "recreational" segment of the Fortymile, mineral licks, all disposal lands, BLM Administrative sites, and the Fort Egbert and Eagle recreation withdrawals. Visual resources would not be impacted by mining locatable minerals on these lands. The remainder of the subunit, 1,920,000 acres would be open for mining. The impacts from the extraction of locatable minerals would vary depending on the methods used, the size of operation and the number of mines.

Large-scale placer mining (semi-mobile plant) operations would impact visual resources through changes to line, form, color, and texture from mined areas and related facilities. It is anticipated that the subunit would have up to three large-scale placer mine operations. Each operation would have a disturbed annual footprint of approximately 36 acres over the life of the mine which is anticipated to be between 10 to 20 years for a total of 60 to 80 acres of disturbance. Impacts from all three operations would impact between 180 to 240 acres over the life of this plan.

The subunit is anticipated to have up to 34 small-scale placer mine operations. Operations would impact visual resources through changes to line, form, color, and texture from mined areas and related facilities. Each operation would have a disturbed annual footprint of 4.4 acres over the life of the mine which is anticipated to be between 10 to 20 years for a total of 20 to 30 acres of disturbance. Impacts from all 34 operations would impact between 680 to 1020 acres over the life of this plan.

Approximately 18 suction dredge operations are anticipated to occur in this subunit. Each operation would have a camp with a footprint of less than one acre over the life of the mine which is anticipated to be between 10 to 20 years. The movement of materials occurs underwater and thus does not have a noticeable impact to visual resources and is generally redistributed each spring during break-up or high water events. Impacts from suction dredge camps are anticipated to be less than 18 acres annually over the life of this plan.

Mineral exploration activities with resulting camp and field sampling would impact visual resources on between six and 208 acres annually. Reclamation would generally occur annually with the only impacts to visual resources from camps. Up to four exploration operations may occur over the life of this plan.

No lands were identified as VRI Class I lands. Of VRI Class II lands five percent (98,000 acres) would be managed under Class III allowing some change in the natural landscape while ninety-five percent (1,764,000 acres) would be managed as Class IV lands allowing a visible level of change to the landscape. Of VRI Class III lands, one-hundred percent or 4,000 acres would be managed as Class IV lands allowing a visible level of change to the landscape. Of VRI Class IV lands, one-hundred percent or 46,000 acres would be managed as Class IV lands allowing a visible level of change to the landscape.

Effects from Salable Minerals

Approximately 145,000 acres would be closed to salable minerals, including the “wild” segments of the Fortymile WSR. Visual resources would not be impacted.

The remaining 1,931,000 acres would be available for mineral sales. Although this alternative would make an additional 101,000 acres available for salable minerals than in Alternatives B and C, impacts would essentially be the same because the level and location of mineral material sales is expected to be the same. Only 100 acres would be mined within the subunit and these sites would generally occur along existing roads.

Effects from Recreation

Recreation Management Zones are managed for different physical settings which include remoteness, naturalness and visitor facilities. Of these, naturalness and visitor facilities impact visual resources by setting prescriptions for management, i.e., describing the amount of naturalness and how facilities will sit on the landscape. These prescriptions provide a range from Primitive, Semi-Primitive, Backcountry, Middlecountry, Frontcountry, Rural and Urban, each with different levels of naturalness and description of how facilities will sit on the landscape

Of VRI Class I lands (144,000 acres) one-hundred percent would be managed as Class I. Of VRI Class II lands, ninety-seven percent or 100,000 acres would be managed as Class III allowing change to the natural landscape, while three percent would be managed as Class IV allowing a visible level of change to the landscape. No lands were identified as VRI Class III lands. Of VRI Class IV lands one-hundred percent (837 acres) would be managed as Class IV lands.

Under this alternative the assignment of VRM Classes would be guided by BLM policy and guidance for designated Wild and Scenic Rivers in that, “wild” segments would be managed as VRM Class I while “scenic” segments would be managed as VRM Class III. The remainder of the subunit including “recreational” river segments would be managed as Class IV. Some

Recreation Management Zones will have different VRM classes due to the designation of the Wild and Scenic River segment.

Effects from Travel Management

Travel management on other BLM lands outside the SRMA

The restriction of winter motorized use to OHVs weighing 1,000 pounds curb weight and less without permit would help reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape on approximately 1,827,000 acres. The season of travel and weight restriction helps reduce the amount of surface disturbance to vegetation and soils even with cross-country travel allowed because of the frozen soils and snow cover on lower growing vegetation. This is the same as Alternatives B and C.

Cross-country summer travel by OHVs weighing 1,500 pounds curb weight and less is allowed. The weight restriction would help reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape. Multiple passes over the same travel route could cause changes in color, line, and texture on the landscape. Repeated OHV use leads to destruction of vegetation, which in turn results in soil exposure, creating a contrast between the adjacent greens of natural vegetation and the browns and grays of exposed soil and organic materials. A contrast in line occurs when the irregular characteristics of vegetation is altered by a more regular line in the form of a developed route or constructed trail. Texture characteristics change from the natural course or rough textures of diverse vegetation to the smooth uniform texture of a developed trail, trail hardening techniques or mineral soil area. These management activities help protect the visual resources on 1,827,000 acres.

All other vehicle use outside the SRMA would require a permit. The impacts larger vehicles would vary depending on the size of vehicle, season of travel, and the number of passes made. They would be similar to impacts described above under Cross-Country Travel except on a larger scale.

Travel management within the SRMA

Common to All Zones

The restriction of winter motorized use to OHVs weighing 1,000 pounds curb weight and less without permit would help reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape on approximately 249,000 acres. The season of travel and weight restriction helps reduce the amount of surface disturbance to vegetation and soils even with cross-country travel allowed because of the frozen soils and snow cover on lower growing vegetation. This is the same as Alternatives B and C.

Within the SRMA, vehicle use exceeding the travel management prescriptions (e.g., vehicles larger than 1,500 pounds curb weight) would require a permit. The impacts larger vehicles would vary depending on the size of vehicle, season of travel, and the number of passes made. They would be similar to impacts described above under Cross-Country Travel except on a larger scale.

Semi-Primitive Zones

The requirement for a permit for summer motorized use within the Semi-Primitive RMZs (including some of the “wild” segments of the Fortymile WSR) would help reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape to 54,000 acres.

All Other Zones

The Backcountry, Middlecountry, Frontcountry, and Rural Zones (including the “scenic”, “recreational”, and some “wild” segments of the Fortymile WSR) would allow cross-country summer travel by OHVs weighing 1,500 pounds curb weight or less. The weight restriction would help reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape. Multiple passes over the same travel route could cause changes in color, line, and texture on the landscape. Repeated OHV use leads to destruction of vegetation, which in turn results in soil exposure, creating a contrast between the adjacent greens of natural vegetation and the browns and grays of exposed soil and organic materials. A contrast in line occurs when the irregular characteristics of vegetation is altered by a more regular line in the form of a developed route or constructed trail. Texture characteristics change from the natural course or rough textures of diverse vegetation to the smooth uniform texture of a developed trail, trail hardening techniques or mineral soil area. These management activities help protect the visual resources on 195,000 acres.

Effects from Special Designations

Under Alternative D, 546,000 acres would be designated as the Fortymile ACEC to protect habitat for the Fortymile caribou herd and Dall sheep. The ACEC would be open to both locatable and leasable minerals. Management decisions to protect wildlife habitat helps to preserve the visual character of the area, but to a lesser extent than in Alternative C.

Of VRI Class I lands (38,000 acres) one-hundred percent would be managed as Class I. Of VRI Class II lands, less than one percent or 257 acres would be managed as Class III while ninety-nine percent (509,000 acres) would be managed as Class IV lands allowing a visible level of changes to the landscape. No lands were identified as VRI Class III lands. Of VRI Class IV lands one-hundred percent (13 acres) would be managed as Class IV lands.

4.4.1.6. Wilderness Characteristics Fortymile Subunit

Summary of Effects

There are 2,035,000 acres identified within the Fortymile Subunit as having wilderness characteristics of size, naturalness, and the opportunity for solitude or a primitive unconfined type of recreation experience. Managing lands for wilderness characteristics would limit surface-disturbing activities. See section 4.3.1.10 Impacts Common To All Subunits for impacts to wilderness characteristics. Alternative B would protect the most acres for wilderness characteristics while Alternative A would not identify any acres as having wilderness characteristic. Alternative C provides a balance between protection and resource use. Alternative D provides for resource development and protects the least amount of land for wilderness characteristics.

4.4.1.6.1. Alternative A (No Action)

Effects from Wilderness Characteristics

No lands are managed for wilderness characteristic under this Alternative. Of the 2,035,000 acres identified as having wilderness characteristic, none would be directly managed to protect

those values. Other actions and management strategies, and lack of activity may help protect those values indirectly.

4.4.1.6.2. Alternative B

Effects from Wilderness Characteristics

Of the 2,035,000 acres identified as having wilderness characteristic, 994,000 (forty-nine percent) would be directly managed to protect those values. These areas include the Fortymile SRMA and the Fortymile ACEC. Other actions and management strategies may help protect wilderness values indirectly on the remaining 1,041,000 acres. Mineral exploration or development is possible on 976,000 acres, however the reasonably foreseeable development scenario does not suggest a high percentage of development during the life of the plan. Even if all development is realized it would affect less than one percent of all available acres. If these mining claims were developed naturalness would be impacted within the view shed of the development until the site was reclaimed to the extent that it appeared natural looking see section 4.3.1.10 Impacts Common to All Subunits.

4.4.1.6.3. Alternative C

Effects from Wilderness Characteristics

Of the 2,035,000 acres identified as having wilderness characteristic, 487,000 (twenty-four percent) would be directly managed to protect those values. These areas include the core of the Fortymile ACEC, the West Fork RMZ (Backcountry ROS Class) and non-navigable “wild” river segments (Semi-Primitive ROS Class). Other actions and management strategies may help protect wilderness values indirectly on the remaining 1,547,000 acres. Mineral exploration or development is possible on 1,311,000 acres, however the reasonably foreseeable development scenario does not suggest a high percentage of development during the life of the plan. Even if all development is realized it would affect less than one percent of all available acres. If these claims were developed naturalness would be impacted within the view shed of the development until the site was reclaimed to the extent that it appeared natural looking see section 4.3.1.10 Impacts Common to All Subunits. Development of recreation facilities and travel management in Middlecountry and Frontcountry RMZs and on other BLM-managed lands would also impact wilderness characteristics.

4.4.1.6.4. Alternative D

Effects from Wilderness Characteristics

Of the 2,035,000 acres identified as having wilderness characteristic, 54,000 (three percent) would be directly managed to protect those values within the Middle Fork Fortymile RMZ. Other actions and management strategies may help protect wilderness values indirectly on the remaining 1,981,000 acres. Mineral exploration or development is possible on 1,920,000 acres, however the reasonably foreseeable development scenario does not suggest a high percentage of development during the life of the plan. Even if all development is realized it would affect less than one percent of all available acres. If these claims were developed naturalness would be impacted within the view shed of the development until the site was reclaimed to the extent that it appeared natural looking see section 4.3.1.10 Impacts Common to All Subunits. Development of

recreation facilities and travel management in Middlecountry and Frontcountry RMZs and on other BLM managed lands would also impact wilderness characteristics.

4.4.1.7. Wildlife Fortymile Subunit

Summary of Effects

Overall, the potential for negative effects to wildlife is least in Alternative A and progressively greater through Alternative D. Regarding recreation and travel management alternatives, however, Alternative B would result in fewer impacts. Alternative B adds over 500,000 acres to the SRMA in a Semi-Primitive RMZ that occurs largely within the Fortymile ACEC. Alternatives C and D establish an SRMA that essentially coincides with the current Fortymile WSR Corridor. Summer OHVs will be limited to less than 1,500 pounds in all action alternatives and to existing trails in Alternatives B and C. Alternative D restricts summer OHV motorized (including motorized boat use) less than Alternatives B and C, with the greatest potential impacts occurring from cross-country OHV use and proliferation of user-created trails.

All action alternatives open considerable areas to mineral location and entry and leasing: forty-seven to ninety-three percent of the subunit. Although mining operations are expected to increase only moderately during the life of the plan under any alternative, Alternative C will open nearly 1.5 million acres to mineral location (and Alternative D 1.9 million acres) which will create negative effects over the long-term for wildlife. Alternatives C and D include no RCAs, so potential impacts to riparian habitats and wildlife species (including BLM sensitive and Birds of Conservation Concern) will be larger than Alternatives A or B. Alternative D opens all BLM-managed calving/postcalving habitat in the subunit to mineral entry, location and leasing, including some of the most highly used calving habitats.

ACECs for caribou and Dall sheep are designated in all action alternatives; their primary effect will be to limit potential impacts from mining activities and motorized vehicle use. The ACEC in Alternative B includes the general calving/postcalving habitats of the Fortymile herd while Alternative C closes only the core calving/postcalving habitats. Alternative D closes only areas around ungulate mineral licks and as a result substantial impacts to Fortymile calving habitat could occur.

Table 4.7. Indicators of Effects of Locatable Minerals on Wildlife in the Fortymile Subunit

Indicator	Alternative			
	A	B	C	D
Closed to Locatables (acres)	2,068,000	1,100,000	608,000	145,000
Open to Locatables (acres)	0	976,000	1,468,000	1,920,000
Open to Locatables (percent)	0	47	71	92
WSR Corridor (acres closed)	248,000	248,000	248,000	146,000
ACEC (acres closed)	0	844,000	352,000	2,000
Within Riparian Conservation Areas (acres)	0	205,000	1,000	1,000
Predicted Mining operations				
Suction dredge operations (number)	6	10	14	18
small-scale placer operations (number)	27	31	33	40
large-scale placer operations (number)	2	3	3	3

Indicator	Alternative			
	A	B	C	D
Proportion of Fortymile calving range closed to mineral location, entry and leasing^a				
Concentrated calving range (percent)	62.5	62.5	49	33

^aThis indicator includes all lands in calving range, including state, private, and National Park Service lands. Other indicators refer only to BLM-managed lands. In Alternative D only the NPS lands in the calving range are closed to mineral entry.

4.4.1.7.1. Alternative A (No Action)

Effects from Fish and Aquatic Species

No RCAs are designated in this alternative. However, new mineral location and associated placer mining operations also do not occur.

Effects from Leasable Minerals

None of the subunit is open to leasing.

Effects from Locatable Minerals

Currently all of the subunit is closed to mineral location and entry, however mining (mostly small-scale placer operations) occurs on existing claims (10,000 acres). This alternative would support the least amount of mining and would minimize the potential for the types of impacts of mining described in section 4.3.1.12 Effects from locatable minerals, common to all subunits. Current mining is mostly suction dredging and small-scale placer mines and is concentrated along and near the road- and river-accessible portions of the Fortymile WSR.

Effects from Recreation

The existing recreation management program has focused on campgrounds and waysides along the Taylor Highway and Fortymile WSR Corridor and Eagle/Fort Egbert. The existing MFP (BLM 1980) is not as specific as current ROS objectives as to how recreation is to be managed, but most the unit has been managed with allowance for dispersed recreation and no development of facilities. Under Alternative A, recreation affects wildlife primarily along the Taylor Highway and road-accessible river sections. Wildlife is displaced, at least temporarily, by recreational activities, and that effect is greater at higher recreational use sites. Disturbance of nesting raptors likely occurs at times along the Fortymile River and may lead to displacement to other areas, nest abandonment or reduced survival of nestlings. ROPs do not exist to protect nest sites of priority raptor species. Bears can be attracted to garbage which can lead to conflicts and potential removal. Recreational OHV users are increasing in number and are traveling further and expanding the zone of impact further, though use and impacts are still concentrated close to roads.

Effects from Travel Management

Currently, all of the Fortymile area is open to small OHV use during both summer and winter, including cross-country travel. Outside of the Fortymile WSR Corridor, there are no OHV restrictions, except that use of vehicles exceeding 6,000 pounds requires a permit. The cross-country use of summer OHVs has resulted in a proliferation of trails leading to local habitat impacts and disturbance impacts. The network of user-created, unsustainable trails can be expected to continue to grow under this alternative, with corresponding increase in impacts to

wildlife. Motorized boats are not permitted on non-navigable “wild” segments of the Fortymile WSR Corridor, which will reduce disturbance impacts to wildlife relative to other alternatives.

Effects from Special Designations

No ACECs exist in this alternative, meaning special management considerations are not afforded to sheep and caribou. Management of the Fortymile River to “preserve the river and its immediate environment and its existing primitive setting” will generally serve to protect wildlife resource values.

4.4.1.7.2. Alternative B

Effects from Fish and Aquatic Species

Eleven drainages are designated as Riparian Conservation Areas, improving the effectiveness of reclamation of mined habitats there. Potential impacts to riparian and aquatic-dependent wildlife, including BLM-Alaska sensitive species and Bird Species of Conservation Concern, will be reduced in these stream sections (two percent of stream miles in subunit).

Effects from Leasable Minerals

Forty-seven percent of the BLM lands in the subunit would be open for leasing. No leasable minerals are expected to be developed in the Fortymile Subunit due to low potential for occurrence of economically recoverable resources. The RMP will need to be amended before coal could be leased. Leasing of other minerals would require additional NEPA analysis. Exploration for leasable minerals could occur throughout the area open to leasing although none is predicted to occur. The entire subunit may be considered for coal inventory and exploration, although none is predicted in the subunit. However, the potential for exploration for leasable minerals does exist and is allowed except in the ACEC and Fortymile WSR Corridor. Considerable surface disturbance may occur with exploration for coal (e.g., 250 x 250 foot trenches, 50 x 40 foot drill pad sites). ROPs and Fluid Mineral Leasing Stipulations (Appendix A, *Required Operating Procedures and Fluid Mineral Leasing Stipulations*) would apply to exploration and leasing, but would result in relatively minor reductions in impacts. Additional ROPs and leasing stipulations would be developed prior to coal or fluid mineral leasing.

Effects from Locatable Minerals

Effects of mining for locatable minerals would increase in this alternative relative to Alternative A because forty-seven percent of the area would be opened to mineral location and entry. Of the BLM lands in the general calving range of the radiocollared Fortymile caribou herd during the last 16 years, almost all remains closed to mineral location and entry. Impacts on caribou calving and postcalving activity and habitat will be minor. Other seasonal caribou habitats, though considered less sensitive, would be open to mining. Also, all Dall sheep range on BLM lands remains closed to mineral location and entry. Suction dredge operations are predicted to increase over Alternative A levels, which may result in disturbance of more nest sites of peregrine falcons. Although the increase in mining activity is predicted to be small (e.g., only four more small-scale placer mines than Alternative A), the location of mining may change, requiring access (roads and trails) which may have larger impacts on wildlife. Also, the increase in exploration and mining operations could be much larger than predicted, dependent on the results of exploration, prices of minerals, and access which may be provided by other activities. ROPs (Appendix A,

Required Operating Procedures and Fluid Mineral Leasing Stipulations) would apply, but would result in relatively minor reductions in impacts.

Effects from Recreation

The Fortymile SRMA (792,000 acres) has specific management objectives and prescription settings. The Fortymile WSR Corridor will be managed mostly for a Semi-Primitive or Backcountry setting. The North Fork Fortymile and Mosquito Fork RMZs will be managed as Semi-Primitive, and the Fortymile RMZ as Backcountry. This high proportion of Semi-Primitive and Backcountry management will limit impacts to wildlife. In this subunit, some motorized use is allowed in Backcountry RMZs, but this use would be managed to retain Backcountry objectives. The remainder of the unit is not a recreation management area and impacts would be similar to those discussed under Alternative A.

Effects from Travel Management

Under Alternative B, summer OHVs and UTVs would be restricted to less than 1,500 pounds curb weight and would be allowed only on existing trails (Map 51) in all areas, except Semi-Primitive RMZs where they would be prohibited. This restriction will minimize proliferation of new trails and reduce impacts to wildlife and wildlife habitats from off-trail use on 120,000 acres.

Effects from Special Designations

The current (1992-2008) general calving/postcalving range of the Fortymile herd is designated as the Fortymile ACEC (Map 62). This includes all Dall sheep range in the subunit. Several ungulate mineral licks occur within the main ACEC boundary, and one mineral lick occurs outside of the main ACEC boundary. This ACEC includes most calving/postcalving habitat on BLM lands in the subunit. These lands will be closed to mineral entry, location, and leasing, and motorized vehicle use will be limited so as to protect the value of the area for caribou. Ungulate mineral licks will be protected from activities that may affect ungulate use of these licks. Potential impacts to caribou will be small, but larger than in Alternative A (which had no ACEC but was entirely closed to mineral location and entry).

4.4.1.7.3. Alternative C

Effects from Fish and Aquatic Species

No RCAs are designated, increasing potential impacts to riparian and aquatic species relative to Alternative B. Since seventy-one percent of area would be opened to mineral location, impacts would also be greater than in Alternative A.

Effects from Leasable Minerals

The effects will be similar to Alternative B, except that seventy-one percent of area is open to leasing and so greater potential for exploration and leasing exists. The area of less concentrated use by calving/postcalving caribou will be open to leasing, however minor restrictions will be in place which will slightly lessen potential impacts.

Effects from Locatable Minerals

Effects of mining for locatable minerals would increase in this alternative relative to Alternative B because seventy-one percent of the area would be opened to mineral location and entry. Of the

BLM lands in the area of concentrated calving/postcalving of the radiocollared Fortymile caribou herd during the last 16 years, almost all remains closed to mineral location and entry. Areas that have been less intensively used or used only in some years by calving/postcalving caribou will be opened to mineral entry. A portion of the area opened will be managed with ROPs (Appendix A, *Required Operating Procedures and Fluid Mineral Leasing Stipulations*) to minimize impacts of mining which occurs on calving caribou.

Under this alternative, the potential impacts to caribou calving and postcalving habitats will be greater, but the most important caribou habitats on BLM lands will remain free of mining. These BLM lands include some of the most concentrated areas of documented calving/postcalving. Also, all Dall sheep range on BLM lands remains closed to mineral location and entry as do identified ungulate mineral licks, including one outside of the main Fortymile ACEC boundary. Suction dredge operations are predicted to increase somewhat over Alternative B levels which may result in disturbance of more nest sites of peregrine falcons. The increase in mining activity is predicted to be small. However, the increase in mining operations could be much larger than predicted, dependent on the results of exploration, the prices of minerals, and access which may be provided by other activities. Also, new mines may be initiated in remote areas, requiring access (roads and trails) which may have larger impacts on wildlife.

Effects from Recreation

In this alternative, only the Fortymile WSR Corridor is included in the SRMA (Map 42), with areas outside managed as undesignated (which will not feature facilities development). The remoteness of the undesignated areas that were Semi-Primitive in Alternative B will probably result in little difference in management, use or effects, in the near future. However, more accessible portions will likely see greater recreation-related changes, and access could be developed to some currently remote areas for purposes such as mining. The changes in management of greater portions of the Fortymile WSR Corridor with objectives for more intensive use will result in somewhat greater change to wildlife habitats than in Alternative B.

Effects from Travel Management

The area where summer OHVs and UTVs would be allowed would expand relative to Alternative B, due to less area in a Semi-Primitive classification. This would allow motorized use in essentially the entire subunit, with the exception of the Semi-Primitive portions of the Fortymile WSR Corridor (which includes most of the “wild” river segments). The increase in impact to wildlife of this change would be small, because existing trail routes are very limited in the portion of the Fortymile WSR Corridor which would be opened to OHV use (head of Hutchinson Creek). New managed trails that may be created in these areas, could be routed to minimize impacts to wildlife. Effects of this alternative relative to Alternative B is dependent on extent of new access created for other activities. OHVs and UTVs up to 1,500 pound curb weight would be allowed off-trail for game retrieval.

Effects from Special Designations

The ACEC in this alternative focuses on the most highly used portions of the most sensitive caribou habitats (current, 1992-2008, calving/postcalving). The areas of most dense use (core habitats) are closed to mineral entry, location, and leasing (and this includes all Dall sheep habitat), while the surrounding area of slightly less dense caribou use is open with ROPs or leasing stipulations designed to mitigate impacts to calving/postcalving caribou. Relative to Alternative B, this alternative would increase the area available for resource development and

increase the potential for fragmentation of caribou calving/postcalving habitat. The ACEC includes and would be compatible with special designations in the State of Alaska Upper Yukon Area Plan for caribou core calving areas and Dall sheep habitat, as well as Leasehold Location Orders for ungulate mineral licks (ADNR 2003).

4.4.1.7.4. Alternative D

Effects from Fish and Aquatic Species

Same as Alternative C.

Effects from Leasable Minerals

Effects will be similar to Alternative C, except that ninety-two percent of the area is open to leasing and so greater potential for exploration and leasing exists. Portions of the Fortymile WSR Corridor remain closed as do known ungulate mineral lick sites. Standard ROPs (Appendix A, *Required Operating Procedures and Fluid Mineral Leasing Stipulations*) will apply to exploration operations, including seasonal restrictions in calving areas and during lambing periods, but more protective ROPs that apply in ACECs will be used only near ungulate lick sites.

Effects from Locatable Minerals

Effects of mining for locatable minerals would increase in this alternative relative to Alternative C because ninety-three percent of the area would be opened to mineral location and entry. Of the BLM lands in the area of concentrated calving/postcalving of the radiocollared Fortymile caribou herd during the last 16 years, almost all is open to mineral location and entry. Only a few ungulate mineral lick sites and very small portions of the calving range which intersect the Fortymile WSR Corridor are closed to mineral entry. Under this alternative, the potential impacts to caribou calving and postcalving habitats will be greatest. Of the entire Fortymile caribou herd recent calving/postcalving range, the only large portion which is closed to mineral location and entry is that portion within Yukon-Charley Rivers National Preserve (Table 4.7, "Indicators of Effects of Locatable Minerals on Wildlife in the Fortymile Subunit"). Three quarters of the area of the most highly concentrated use by caribou for calving will be open for mineral entry. Also, all Dall sheep range on BLM lands is open to mineral location and entry except for one identified mineral lick.

Major portions of the Fortymile WSR Corridor are open to locatable and leasable minerals. Impacts to riparian habitats from placer mining, and increased disturbance from boat and mining activity can be expected. Although nearly two million acres are opened to mineral location and entry, mining operations on BLM lands are predicted to increase (relative to Alternative A; all closed) by 12 suction dredge, 13 small-scale placer, one large-scale placer and zero large lode operations (Table 4.7, "Indicators of Effects of Locatable Minerals on Wildlife in the Fortymile Subunit"). Although the level of mining activity predicted represents a very small portion of the subunit, new mines will likely be initiated in remote areas and require access (roads and trails), which may have larger impacts on wildlife. The amount and length of features is dependent on the location of the new mining claims and mines. At these predicted levels of mining, the impact of BLM actions on Fortymile caribou will likely be modest during the life of the plan. Portions of the calving/postcalving range may be developed which will represent a small loss or fragmentation of habitat and an incremental reduction in Fortymile caribou range quality.

However, it is also possible that the increase in mining operations could be much larger than predicted or located in key habitats. Dependent on the results of exploration, prices of

minerals, and access routes which may be provided by other activities, mining activity can vary substantially and impacts could be considerably greater than anticipated.

Opening of nearly two million acres to mineral location and entry will likely result in substantial exploration activity. Seasonal ROPs (Appendix A, *Required Operating Procedures and Fluid Mineral Leasing Stipulations*) are in place to limit aircraft activity close to the ground in caribou calving/postcalving habitats and Dall sheep habitats during lambing. ROPs concerning activities near raptor nest sites are also part of this RMP, but little is known of raptor nest sites in the subunit except for peregrine falcons within portions of the Fortymile WSR Corridor. Disturbance of caribou and sheep will occur outside of the restricted time periods and disturbance of undocumented raptor nests will occur. Surface disturbance involving roads and many drill pads could potentially occur at larger deposits.

Effects from Recreation

As in Alternative C, only the Fortymile WSR Corridor is included in the SRMA. Some segments will be managed to allow greater recreation-related change to the landscape (e.g., more Frontcountry and Middlecountry), resulting in corresponding increases to impacts to wildlife, particularly in the more accessible portions of the subunit.

Effects from Travel Management

The area where summer OHVs would be allowed would expand relative to Alternative C, due to less area in Semi-Primitive RMZ classification (Map 43). OHVs would not be restricted to existing trails and would be allowed to travel cross-country. Impacts under this alternative would be similar to Alternative A. Although summer OHVs would be limited to 1,500 pounds curb weight, an expanding network of user-created trails can be expected.

Effects from Special Designations

A 546,000-acre ACEC is designated in this alternative (Map 63), but only the half-mile radius around ungulate mineral licks is closed to mineral entry and location. The rest of the ACEC, except small portions of the Fortymile WSR Corridor, is open to mineral entry and location (as well as cross-country OHV use), including some of the most highly used portions of the Fortymile herd calving and postcalving range and all Dall sheep habitat for the Glacier Mountain and Mount Harper subpopulations. ACEC-specific ROPs and Fluid Mineral Leasing Stipulations (Appendix A, *Required Operating Procedures and Fluid Mineral Leasing Stipulations*) would apply to BLM permitted activities in the concentrated calving/postcalving area: seasonal activity restrictions will apply, impacts of access will be minimized, and operators must submit a plan describing methods proposed to minimize impacts to caribou and Dall sheep and their habitat.

Although the near-term development of mineral resources on these lands is predicted to be low, new exploration results, changing market conditions, or creation of new access to these areas by other operations or activities may change that prediction. In addition, staking of mining claims in the calving area would potentially have impacts far in the future. Use of ROPs for operations in the ACEC may mitigate a small portion of impacts, but most will remain, especially in the case of locatable minerals, where the location of the operation is fixed and development of the mineral deposit is not a discretionary decision by the BLM. Under this alternative, only twenty-nine percent of the Fortymile caribou herd concentrated calving area would be closed to mineral location, entry, and leasing (such as that within Yukon-Charley Rivers National Preserve).

Some fragmentation of habitats and reduction in habitat quality for caribou and Dall sheep are likely under this alternative.

4.4.1.7.5. Cumulative Impacts

Cumulative impacts will be greatest to caribou and are discussed in section 4.3.1.12 Wildlife, Effects Common to All Subunits, because Fortymile caribou range across all subunits (and into Canada). Other wildlife species will also experience effects similar to those discussed in that section. The lands in the Fortymile subunit are more dispersed among other landowners than in other subunits, so cumulative impacts will be determined to a greater extent by actions on other lands.

4.4.2. Resource Uses

4.4.2.1. Locatable Minerals Fortymile Subunit

Summary of Effects

Under Alternative A, the potential for future exploration and development would be limited to existing mining claims. Mining activity would decrease over time as land encumbrances would prohibit new mining claims. Alternatives B, C, and D would open large acreages to new mineral entry, ranging from 976,000 acres to 1,920,000 acres, including some high mineral potential lands, pending the removal of existing withdrawals. All alternatives would close portions of the Fortymile WSR Corridor, impacting locatable minerals. All closures or restrictions would prevent obtaining the minerals, and their benefits to society would remain unavailable for the foreseeable future. Additionally, the infrastructure that typically accompanies development would not occur.

4.4.2.1.1. Effects Common to All Alternatives

State- and Native-selected lands would remain segregated from mineral entry and location until final land title has been established. New mining operations, regardless of size, on withdrawn lands would require a validity exam prior to approval of a Plan of Operation. All active mining operations would be required to submit a Plan of Operation if the 1,000 ton bulk sample is exceeded (3809.11(b)). Mining operations using cyanide in the processing of amenable ores would require a Plan of Operations and a financial guarantee outside the statewide bond pool. Mining claim surface occupancy would be guaranteed, but it must remain reasonably incident to the current levels of mining activity. Bonding would be required of all mining operations other than those grandfathered under 43 CFR 3809.300 and 43 CFR 3809.400. Reclamation of surface disturbance is required. Undue and unnecessary degradation would remain the standard for mining operations on BLM lands. The right of reasonable access across BLM lands to unpatented federal mining claims would be assured. Cultural resources encountered during surface-disturbing activities are subject to the Antiquities Act (43 CFR 420(b)(8)).

Riparian Conservation Areas (RCAs) would be established on river drainages that have been identified for the protection of fish resources. Due to the use of stream buffers, the RCAs would act as an discretionary closure to locatable minerals. Stream buffer widths would range from 25 to 200 feet in width depending on site-specific factors.

The RCAs would restrict placer mining in the creek and within the stream buffer. Suction dredging and mining on the bench outside the buffers would be allowed. A small channel could be authorized to facilitate drainage through the riparian back to the active channel of the stream. However, it would still be cost prohibitive to operate with obstacles preventing free access to water. RCAs would result in a significant restriction to locatable mineral exploration and development. Additionally, the gold (or other commodity) recovery from a bench claim would not necessarily be equivalent to what is available in the stream from prospecting. It would also be more difficult to make the initial discovery.

The BLM would conduct an analysis to determine the minimum buffer size needed. However, operators would have to rely on pumping water to their bench operations. This additional cost for doing business would turn many prospective miners away and recovery of those minerals within the RCA would not be available for the benefit of society.

4.4.2.1.2. Alternative A (No Action)

Under Alternative A, no withdrawal review would occur and all ANCSA 17d(1) withdrawals would not be revoked. The BLM would continue to administer new and existing operations on federal unpatented mining claims through Notices or Plans of Operations. However, the potential for future exploration and development would be limited to 10,000 acres of existing mining claims. Overall mining activity will likely decrease as there would be no opportunities to stake new federal claims to offset claim attrition. This alternative would offer no process to address these mineral closures.

4.4.2.1.3. Alternative B

Under Alternative B, 1,100,000 acres would be closed to locatable mineral entry in the Fortymile Subunit. Most closures would be discretionary, with the exception of the “wild” segments of the Fortymile WSR. Closures include the Fortymile WSR Corridor, the Fortymile SRMA, the Fortymile ACEC, mineral licks, disposal lands, BLM Administrative Sites, Fort Egbert, and the Eagle recreation withdrawal. There would be 11 RCAs that would impose additional closures through stream buffers. Additionally, the Sam Patch Creek – Fortymile River watershed would be identified as a High Priority Restoration Watershed and emphasized for restoration.

The mineral closures associated with the Fortymile River would be the most likely to impact locatable minerals. The Fortymile River has historically been known for mining and is considered to have high mineral potential for location. Operating mining claims in the drainage currently exist, but if they were lost by the claimants no additional staking could be made. All closures or restrictions prevent obtaining the minerals and their benefits to society would remain unavailable for the foreseeable future. Additionally, the infrastructure that typically accompanies development would not occur.

The remaining 976,000 acres in the subunit would be open to locatable minerals, including some high mineral potential lands. An estimated total of three large-scale placer, 31 small-scale placer, and 10 suction dredge operations could occur on lands that are available to entry (two large-scale placer, 27 small-scale placer, and seven suction dredge operations already exist).

4.4.2.1.4. Alternative C

Under Alternative C, 608,000 acres in the Fortymile Subunit would be closed to locatable mineral entry. Closed areas include the same areas that are closed under Alternative B, except for a portion of the Fortymile ACEC. Additionally, the Sam Patch Creek-Fortymile River watershed would be identified as a High Priority Restoration Watershed. If this watershed were restored, those restored portions would not be available for mining and it would be considered closed for the life of the plan. The 608,000 acres closed to mineral entry would constrain extraction of the minerals and their benefits to society would remain unavailable for the foreseeable future. Additionally, the infrastructure that typically accompanies development would not occur.

The remaining 1,468,000 acres in the subunit would be open to locatable mineral entry, including some high potential lands. An estimated three large-scale placer, 33 small-scale placer, and 14 suction dredge operations could occur on lands that are available (two large-scale placer, 27 small-scale placer, and seven suction dredge operations already exist).

4.4.2.1.5. Alternative D

Under Alternative D, 156,000 acres in the Fortymile Subunit would be closed to locatable mineral entry. Closures include only the “wild” and “recreational” segments of the Fortymile WSR, mineral licks, disposal lands, BLM Administrative sites, Fort Egbert, and the Eagle recreation withdrawal. One difference from Alternative C would be that “scenic” segments of the Fortymile WSR would be open to mineral location. Effects from the Sam Patch Creek – Fortymile River High Priority Restoration Watershed would be the same as Alternative C. Although this alternative would close much fewer acres than Alternatives B or C, the areas that would be closed contain high mineral potential.

The remaining 1,920,000 acres in the subunit would be open to locatable minerals, including some high potential lands. An estimated three large-scale placer, 34 small-scale placer, and 18 suction dredge operations could occur on lands that are available (two large-scale placer, 27 small-scale placer, and seven suction dredge operations already exist).

4.4.2.1.6. Cumulative Impacts

Impacts to locatable minerals that are individually minor may cumulatively reduce exploration and production of commodities from public lands. Factors that affect mineral extraction and prospecting include, but are not limited to, such things as permitting and permitting delays, regulatory policy, public perception and concerns, travel management, transportation, mitigation measures, proximity to sensitive areas (ACECs, RCAs, etc), low commodity prices, taxes, and housing and other necessities for workers. Many of these issues are issues over which the BLM has no control. Most of these issues result in additional costs or permitting delays that can individually or cumulatively impact projects.

Public land that currently has no access could reduce the amount of mineral exploration and development that may occur. Mineral resources on non-BLM lands may not be developed if the adjacent public lands are withdrawn from mineral entry.

Overall, Alternative B would be the most restrictive to mineral developments and could result in the greatest cumulative impacts. It proposes the most acres be maintained as withdrawn from

mineral entry, the most areas limited or closed to motorized travel, and the highest protection to other resources. Alternative D would have the fewest cumulative impacts.

4.4.2.2. Recreation Fortymile Subunit

Summary of Effects

Effects on recreation management from the proposed alternatives would result in a wide range of possible outcomes. Proper resource management, including site-specific measures to protect healthy, functioning watersheds, riparian areas, and associated fish and wildlife habitats, would result in short- and long-term, beneficial impacts to fish and game related recreation use.

Special designations and management applied to these areas, including ACECs and WSRs, would further protect the region, increasing wildlife numbers that benefit wildlife viewing, hunting, and fishing opportunities. Proposed management in ACECs and WSRs would encourage recreation activities of a more non-motorized, Semi-Primitive nature. As the size and scope of these special designations increase, opportunities for non-motorized forms of recreation would also increase. Negative effects from these designations would also arise, if additional restrictions were placed on OHV use and other recreational activities.

The delineation of special recreation management area (Fortymile SRMA) would protect and enhance recreational resources while encouraging specific targeted outcomes in these areas. Land, water, and snow based activities would continue to remain the focus in these designations, including the commonly conducted activities of boating and river based recreation, camping, fishing, gathering of edible plants and berries, hiking and backpacking, hobby mineral collecting, and OHV use.

Alternative C best meets the goal of providing for multiple recreation use, while sustaining the recreation-resource base and other sensitive resource values of the region. Alternative B emphasizes less motorized recreation use in a more primitive setting, while Alternative A offers more motorized recreation use and includes the most acreage for cross-country OHV travel, followed by Alternative D.

Table 4.8. Comparison of Recreation Indicators: Fortymile Subunit

Indicator	Alternative		
	B (acres)	C (acres)	D (acres)
Special Recreation Management Area	792,000	249,000	249,000
Other BLM Lands	1,284,000	1,827,000	1,827,000
Recreation Opportunity Spectrum Class (acres)			
Primitive	0	0	0
Semi-Primitive	617,000	120,000	54,000
Backcountry	164,000	106,000	96,000
Middlecountry	6,800	11,500	77,000
Frontcountry	3,400	10,200	14,900
Rural	840	840	7,640

4.4.2.2.1. Effects Common to All Alternatives

Effects from Forest and Woodland Products

Under all alternatives, the effects of forest and woodland products harvest would result in minimal impacts to recreation management. Current levels of firewood collection, commercial harvests, and forest products gathering would continue to be sustained without significant resource damage. However, if significant sales of forest products took place, due to bark beetle infestations or from commercial timber harvests, recreational users would see increased trails, potential dislocation of wildlife, and alteration of scenic viewsheds.

Although the areas open to commercial uses vary between alternatives, the low demand and lack of timber resource would limit these uses and any effects on recreation in all alternatives.

Effects from Wildlife

Wildlife goals of protecting and enhancing wildlife populations and crucial habitat areas would continue to impact recreation. Through avoidance areas and other restrictions on recreational development including possible seasonal or timing closures, location changes, and limiting the extent of activities or development; wildlife concerns could make certain projects more costly, more difficult if not impossible to accomplish, or may not meet recreation objectives after restrictions are placed on them. Healthy wildlife populations would benefit hunting, wildlife viewing, and trapping which are all generally secondary activities in most RMZ's; but placing access restrictions could offset that benefit to participate in those activities. The biggest impacts to recreation from wildlife would be in limiting potential motorized and non-motorized recreational opportunities.

The prohibition of the use of domestic goats, sheep and camelids in Dall sheep habitat could impact recreation use by users seeking to use these animals as pack animals as part of their recreation experience. It is anticipated that this is a small user group but interest has been growing in the lower 48 states.

Effects from Recreation

Under all alternatives, management actions would continue to provide for multiple recreation uses, including a wide-range of structured opportunities that produce specific targeted outcomes (such as activities, experiences, benefits, and settings). The Eastern Interior FO would continue to manage the 392 miles of river segments that comprise the Fortymile WSR, to preserve and enhance their resource values. Management would also continue for the three developed campgrounds, seven waysides, and one National Historic Landmark that presently exist within the Subunit. Together, these actions would directly affect recreation management by ensuring that land- and water-based recreational opportunities continue to exist in both designated and undesignated areas.

Special Recreation Permits would continue to be issued as appropriate for commercial, competitive, and special event use, allowing managers to provide for safe and enjoyable recreation opportunities at fair and allowable levels. This would minimize user conflicts while ensuring that recreation activity levels do not negatively impact the recreation-resource base and other sensitive resource values of the region.

Under the A alternative, winter use (October 15 through April 30) of snowmobiles of 1,500 pounds GVWR and less would be allowed and under Alternatives B, C, and D winter use (October 15 through April 30) of snowmobiles of 1,000 pounds curb weight and less would be allowed, nearly the same as Alternative A, providing opportunities for recreational users during the winter months. During the summer months, all forms of non-motorized use would

generally be allowed, except to protect specific resource values, preserve public safety, and maintain identified recreation opportunities.

Effects from Salable Minerals

Most salable mineral sites (such as gravel pits) are located within or adjacent to roads and highways. As a result, impacts from salable mineral management have little effect on recreational experiences. Where gravel pit development occurs, reduced viewsheds would inhibit the quality of visual resources. However, gravel pits would also provide users with de-facto parking areas and areas for motorized play.

Effects from Travel Management

Under all alternatives, travel management actions would provide for a range of motorized and non-motorized recreation experiences, while protecting resource values and minimizing user conflicts. This comprehensive approach to travel management would allow the BLM to sustain and enhance recreation opportunities and experiences, visitor access and safety, and resource conservation.

All forms of non-motorized use would be allowed, providing users with opportunities for float-boating (including rafting, kayaking, and canoeing), hiking, biking, and horseback riding. Winter use (October 15 through April 30) of snowmobiles of 1,500 pounds GVWR (Alternative A), and 1,000 pounds Cub Weight (Alternatives B, C, and D) or less would be allowed, providing opportunities for recreational users during the winter months. The use of aircraft would also be allowed, subject to reasonable provisions to protect the values of the Fortymile WSR.

4.4.2.2.2. Alternative A (No Action)

Effects from Visual Resources

Under this alternative, no VRM classes have been established, except in the “wild” segments of the Fortymile WSR, which is managed as VRM Class I by policy. The lack of VRM class designations would have a limited effect on recreation as the effects to scenic quality would be evaluated and mitigated for any proposed project.

Effects from Lands and Realty

Under Alternative A, no lands are specifically identified for disposal or acquisition and there would be no impact to recreation from land tenure actions.

Land use authorizations, such as leases and permits, could potentially result in additional development that may adversely affect those areas being managed for Primitive or Semi-Primitive recreation experiences. These effects may include impacts to visual resources, increased visitor encounters, and a diminished recreation experience. On the other hand, land use authorizations could also result in increased access opportunities, for those seeking a motorized experience.

Maintenance of the withdrawal of the Wade Creek “recreational” segment of the Fortymile WSR would allow the BLM to manage this area for recreational gold panning.

Under Alternative A, long-term camping permits for commercial purposes (i.e., camping in association with mining on state mining claims adjacent to BLM lands) is allowed in the “scenic” and “recreational” segments of the Fortymile WSR Corridor, but not the “wild” segment. The

effect of this decision is that operators working state mining claims in the “wild” segments of the river must camp on state land, or below ordinary high water. As a result, the entire camp, as well as the suction dredging operation, is visible to recreational users of the “wild” segments of the Fortymile WSR, affecting the scenic quality of the experience. This may negatively effect those users anticipating a Primitive recreational experience on the “wild” segments of the river.

Effects from Locatable Minerals

Although no new lands would be opened to mineral entry in Alternative A, some mining would continue to occur on valid existing claims. Six suction dredge operations, 27 small-scale placer mine operations, and two large-scale placer mine operations are anticipated. Under all alternatives, mineral development through the use of suction dredging or placer mining activities, has the potential to affect recreation management, particularly if development occurs in areas that provide Semi-Primitive recreation experiences. The development of necessary infrastructure for mineral activities could compromise the experiences of those recreation users whose expectations include a high degree of solitude and tranquility, within a naturally-appearing landscape. Adverse impacts on recreation users could also arise from intrusive noise and altered viewsheds produced by mining equipment and OHVs that are used in mining operations. Small mineral development may enhance recreational access by providing for remote airstrips and localized OHV trails.

Effects from Recreation

In addition to those effects discussed under the Effects Common to All Alternatives section above, the BLM would continue to manage only one SRMA, the Fortymile River (249,000 acres), under this alternative. Facility enhancements (such as roads, toilets, boat ramps, and parking areas) may be added to these areas to accommodate increasing recreation demand. All public lands outside of the Fortymile River SRMA would be managed as other BLM lands (1,827,000 acres). Management outside the SRMA would generally be custodial action only, and would result in less facility enhancements (such as trails or interpretive panels).

Effects from Travel Management

This alternative provides the most motorized public access of any of the alternatives, as OHV use would continue to be managed in accordance with existing OHV limitations. Travel within the Fortymile WSR Corridor would be limited to vehicles 1,500 pounds GVWR and less, while travel outside of the corridor would remain generally unrestricted, as there are no OHV designations in place.

Allowing this level of continued OHV use would not address resource and user conflict issues and could result in emergency closures to protect the recreation-resource base and other sensitive resource values of the region. These actions could also result in long-term, detrimental impacts to scenic viewsheds that enhance the quality of recreational experiences for other recreation users. Thus, while this alternative would offer the most opportunities for recreational activities that involve the use of motorized travel, including hunting and OHV riding; fewer opportunities would exist for recreational users seeking a Semi-Primitive, non-motorized type of experience, characterized by a high degree of solitude and tranquility, within a naturally-appearing landscape.

In Alternative A motorized boat travel is allowed on all designated navigable sections of the Fortymile WSR. Motorized use is prohibited on the non-navigable sections except under the provisions of 43 CFR 3809. By not allowing motorized boat use on the non-navigable sections opportunities for a more primitive experience are greatly enhanced. Motorized use on the

“scenic” segments of the river do detract from the naturalness enjoyed by most recreational users, but is not managed to the same degree of primitive as the non-navigable sections. The sounds and sights of motorboats and other watercraft passing float-boat users does incur an increased impact on the recreational experience, but is generally temporary in nature. The overall impacts are expected to be light.

Effects from Special Designations

There would be no impacts from ACECs, as no areas are currently being managed for ACECs under Alternative A.

Under all alternatives, the 392 miles of river that comprise the Fortymile WSR would continue to be managed to preserve and enhance their Outstandingly Remarkable Values. This designation would provide long-term, beneficial impacts to those recreation users seeking land- and water-based recreation activities in these areas.

4.4.2.2.3. Alternative B

Effects from Visual Resources

Under this alternative, the “wild” segments of the Fortymile River would be identified as VRM Class I, the “scenic” segments would be Class II, and the “recreational” segments would be Class III. RMZs with a ROS Class of Semi-Primitive or Backcountry would be Class II, while Middlecountry, Frontcountry, or Rural would be Class III. All remaining BLM-managed lands would be assigned Class IV. These visual resource management decisions would have long-term, beneficial impacts on recreational activities that include scenic qualities as part of the experience. Minor effects of visual resource management may result if restrictions are placed on facility development or OHV use, in areas that possess increasing recreation demands.

Effects from Wilderness Characteristics

For those individuals who seek a primitive and unconfined recreation experience, areas identified to be maintained for wilderness values would be protected and preserved to ensure that they continue to remain available for appropriate uses (such as hiking, sightseeing, photography) by present and future recreation users. Under this alternative, forty-seven percent of the subunit (994,000 acres), within the Fortymile ACEC and on Wild and Scenic River segments that do not contain mining claims, would be managed to maintain wilderness characteristics.

Effects from Land and Realty Actions

Alternative B identifies numerous parcels (Appendix G, *Land Tenure*) for disposal. All of the lands proposed for disposal are isolated from other BLM lands and not easily managed and disposal would not decrease the area of public lands available for recreation activities. The acquisition of private land inholdings from willing sellers within areas identified as Zone 1, including lands in the Fortymile WSR Corridor and Fortymile ACEC, could provide long-term, beneficial impacts to those recreation users seeking land- and water-based recreation experiences in these areas.

The authorization of long-term camping permits for commercial purposes would not be allowed in “wild,” “scenic,” or “recreational” segments of the Fortymile WSR Corridor. This restriction would impact the scenic viewshed and Primitive recreational experiences on any segment of

the river where suction dredging was occurring on state mining claims. The effects would be somewhat higher than under Alternative A.

Effects from Locatable Minerals

Under Alternative B, impacts to recreation from locatable minerals would be similar to, but somewhat greater than those discussed under Alternative A as mining activity increases in response to opening additional lands to mineral entry. Approximately 977,000 acres would be opened to locatable mineral entry and 10 suction dredge operations, 31 small-scale placer mine operations, and three large-scale placer mine operations are expected to develop within the Fortymile Subunit. The areas that currently have the most concentrated recreational use, the Fortymile WSR Corridor, Fort Egbert, and the Eagle Recreational withdrawal, would remain closed to new mineral entry. Additional effects to recreation would be in areas of more dispersed recreation use.

Closure of 1,100,000 acres to locatable mineral entry, including the Fortymile SRMA would help to maintain the ROS setting prescriptions identified for the recreation management of all physical, social, and administrative settings of the region. Withdrawal of the “recreational” segment of the Fortymile (Wade Creek) would allow the BLM to manage this area for recreational gold panning.

Effects from Recreation

In addition to those effects discussed under the Effects Common to All Alternatives section above, the BLM would continue to manage one SRMA (792,000 acres) under Alternative B. When compared to Alternative A, the size of the SRMA would increase by 318 percent.

Management actions would provide for multiple recreation activities within a variety of ROS settings. The BLM would manage 617,000 acres as Semi-Primitive, 164,000 acres as Backcountry, 6,800 acres as Middlecountry, 3,400 acres as Frontcountry, and 840 acres as Rural. Semi-Primitive (seventy-eight percent) accounts for the largest setting, while Frontcountry (0.4 percent) and Rural (0.1 percent) represent the smallest settings. These percentages are indicative of the management emphasis for recreation activities on BLM-managed lands. A much greater portion of the Subunit would be reserved for the Semi-Primitive experiences of non-motorized use, when compared to the more Frontcountry experiences of motorized use. Facility structures would be primarily limited to rustic and rudimentary buildings, generally constructed using natural materials, and designed to blend with surrounding landscape. These management decisions would affect recreation by providing high-quality recreation opportunities for those users who desire an experience characterized by solitude, tranquility, and self-reliance.

Effects from Travel Management

Under Alternative B, travel management prescriptions for the Semi-Primitive Zones (Map 41) would require a permit or approved plan of operation for all forms of OHV use, except the winter use of snowmobiles of 1,000 pounds curb weight and less. As a result, more area would be made available for recreational users seeking primitive, non-motorized forms of recreation, including hiking, horseback riding, and float-boating opportunities. In contrast, less area would be available for those users seeking motorized forms of recreation, including boating and OHV use.

Travel within BLM managed lands outside the SRMA, Backcountry, Middlecountry, Frontcountry, and Rural Zones (Map 51) would be limited to the summer-use of OHVs (weighing 1,500 pounds curb weight and less) on existing routes only, and the winter use of snowmobiles of

1,000 pounds curb weight and less. All other forms of OHV use within these zones would require a permit or approved plan of operation. These management actions, while benefiting the effect on visual resources (through limiting the establishment of trails), would negatively impact those users who utilize OHVs for accessing remote areas, and by those retrieving game.

Under Alternative B, all forms of non-motorized use would be allowed. Motorboat use would generally be allowed without specific authorization consistent with ANILCA sections 1110(a) and 811. Airboats, hovercraft, and personal watercraft would not be permitted in the following non-navigable river segments: the North Fork above the Kink, the Middle Fork, Champion Creek, Joseph Creek, Mosquito Fork above Ingle Creek, and Gold Run suitable segments. The closure procedures under 43 CFR 36.11(h) would be followed. The airboat, hovercraft, and personal watercraft closures in the Semi-Primitive North Fork Fortymile and Mosquito Fork Fortymile RMZ's would enhance the opportunities which they are designated for. Motorboat use in these areas would cause less impact than the louder airboat and hovercraft vessels, but could still create temporary impacts to recreational float-boaters seeking a Semi-Primitive experience. The long-term impacts are expected to be fairly minimal due to the natural barriers and limitations of vessels to access these sections of the river. On the remaining sections of the river in both Semi-Primitive and Backcountry RMZs, the allowance of motorboats, airboats, hovercrafts, and personal watercraft would continue to create temporary sound and sight impacts to recreational users; but the setting prescriptions would offer greater allowances for these impacts. Overall impacts from motorized use on the river is not anticipated to change much from the current situation.

Overall, Alternative B offers the least opportunity for recreational activities that involve the use of motorized travel, compared to all other alternatives.

Effects from Special Designations

Under this alternative, 732,000 acres would be designated as the Fortymile ACEC to protect caribou and Dall Sheep habitat. This ACEC designation would maintain or protect wildlife habitat, potentially increasing wildlife numbers that have beneficial impacts on wildlife viewing and hunting. Negative effects of ACEC designation may also result, if additional restrictions are placed on OHV use and other recreational activities.

Under Alternative B, two eligible river segments (Gold Run and Dome Creek) would be recommended as suitable for designation under the WSR Act. If they were designated by Congress, the effect of these inclusions into the WSR system would ensure the protection and enhancement of the outstandingly remarkable historic values for which the rivers were identified, providing long-term, beneficial experiences for those individuals seeking historical and cultural appreciation opportunities. Effects from the Fortymile WSR designation would be the same as Alternative A.

4.4.2.2.4. Alternative C

Effects from Visual Resources

Effects would be the same as discussed under Alternative B, except less area would be designated as VRM Class I and II, and more area in Class III and IV. In addition, "recreational" segments of the Fortymile River that were identified as Class II, under Alternative B, are now identified Class IV. These visual resource management decisions would result in fewer restrictions being placed on

facility development or OHV use in areas of increasing recreation demand. However, fewer areas would be protected for recreational activities that include scenic qualities as part of the experience.

Effects from Wilderness Characteristics

Effects would be the same as discussed under Alternative B, except less area would be managed to maintain the wilderness characteristics of naturalness and solitude, or primitive and unconfined recreation. Under this alternative, twenty-three percent of the Subunit (487,000 acres), within non-navigable “wild” river segments, including the North Fork above the Kink and the Mosquito Fork, would be managed to maintain wilderness characteristics.

Effects from Land and Realty Actions

Effects from land tenure decisions (such as disposals and acquisitions) would be the same as discussed under Alternative B.

Under Alternative C, the authorization of long-term camping permits for commercial purposes would be allowed in the “scenic” and “recreational” segments of the Fortymile WSR Corridor, but not the “wild” segment. The effect of this decision would be the same as Alternative A.

Effects from Locatable Minerals

Impacts to recreation from locatable minerals would be similar to, but slightly greater than those discussed under Alternatives A and B. Under Alternative C, 1,496,000 acres would be opened to locatable mineral entry and approximately 14 suction dredge operations, 33 small-scale placer mine operations, and three large-scale placer mine operations are expected to occur.

As in Alternative B, the Fortymile WSR, Fort Egbert, and the Eagle Recreational withdrawal would remain closed to new mineral entry. Closure of 608,000 acres to locatable minerals would enhance recreation by protecting caribou and Dall sheep habitat, helping to preserve both the Outstandingly Remarkable Values of the Fortymile WSR and recreation opportunity settings, and allow the BLM to manage the “recreational” segment of the Fortymile WSR for recreational gold panning.

Effects from Recreation

In addition to those effects discussed under the Effects Common to All Alternatives section above, the BLM would continue to manage only one SRMA (249,000 acres) under this alternative. Thus, while similar in size to Alternative A, the SRMA designation for this alternative would decrease by 318 percent, when compared to Alternative B. As a result, more area would be managed outside the SRMA, resulting in fewer facility enhancements and fewer restrictions on OHV use. Accordingly, slightly more motorized opportunities would be available due to the increased area of lands outside the SRMA.

Similar to Alternative B, the BLM would manage for multiple recreation activities within a variety of ROS settings. This alternative would recognize 120,000 acres as Semi-Primitive, 106,000 acres as Backcountry, 11,500 acres as Middlecountry, 10,200 acres as Frontcountry, and 840 acres as Rural. Like Alternative B, Semi-Primitive (forty-eight percent) accounts for the largest setting, while Frontcountry (four percent) and Rural (0.3 percent) represent the smallest setting; effects on recreation from these designations are similar to those described under Alternative B.

Effects from Travel Management

Effects would be similar to Alternative B, except more area would be made available for recreational activities that involve the summer-use of motorized travel. Travel on lands outside the SRMA, and within Backcountry, Middlecountry, Frontcountry, and Rural Zones (3, 4, 5, 6, 7, 8, 9 and 10) would be limited to summer-use of OHVs (weighing 1,500 pounds curb weight and less) on existing routes only, except for game retrieval. This would provide a direct benefit to recreational hunters who could retrieve legally harvested big-game animals off of pre-existing routes.

Effects from Special Designation

Under Alternative C, 546,600 acres would be designated as the Fortymile ACEC. Effects would be the similar as those discussed under Alternative B, except less area would be designated to protect caribou habitat.

Effects from the Fortymile WSR designation would be the same as Alternative A. No additional river segments would be recommended for designation, thus there would be no beneficial effects from designation of new rivers.

4.4.2.2.5. Alternative D

Effects from Visual Resources

Effects would be similar to Alternative C, except more area is classified as VRM Class III and IV, and less area in Class II. These decisions would result in less protection of important viewsheds for recreation activities that include scenic qualities as part of the experience. In contrast, fewer restrictions would be placed on facility development or OHV use in areas that possess increasing recreation demand.

Effects from Wilderness Characteristics

Effects are expected to be very minimal in Alternative D. 54,000 acres are identified to be maintained as lands with wilderness characteristics or 2.5 percent of the area. The majority of these areas would include the Semi-Primitive RMZ's in which compatible objects could be attained

Effects from Land and Realty Actions

Effects from land tenure decisions (such as disposals and acquisitions) would be the same as discussed under Alternative B.

Under Alternative D, the authorization of long-term camping permits for commercial purposes would be allowed in the "wild," "scenic," and "recreational" segments of the Fortymile WSR Corridor, allowing for camps associated with suction dredging on state mining claims to be located on the uplands in all river segments. Recreational users of the river would still see the suction dredging operation, but the camps would be screened from view. Impacts to scenic quality would be reduced compared to Alternatives A, B, and C. The recreational experience on the "wild" segments of the river would likely be of a more primitive nature.

Effects from Locatable Minerals

Under Alternative D 1,922,000 acres would be open to locatable mineral entry and approximately 18 suction dredge operations, 34 small-scale placer mine operations, and three large-scale placer

mine operations are expected to occur. The effects on recreation from locatable mineral entry would be similar to, but slightly greater than under Alternatives A, B, and C. The “scenic” segments of the Fortymile WSR would be opened to new mineral entry. Unlike the other alternatives, there would be effects within portions of the Fortymile WSR Corridor. If mining occurred, this could negatively affect recreation opportunity and settings. Closure of 156,000 acres to locatable minerals would enhance recreation in these areas.

Effects from Recreation

In addition to those effects discussed under the Effects Common to All Alternatives section 4.4.2.2 above, the BLM would continue to manage one SRMA (249,000 acres) under this alternative. While the SRMA designation for this alternative would be identical in size to Alternatives A and C, it would be 318 percent smaller than Alternative B.

Similar to Alternatives B and C, the BLM would continue to manage for multiple recreation activities within a variety of ROS settings. This alternative would recognize 54,000 acres as Semi-Primitive, 96,000 acres as Backcountry, 77,000 acres as Middlecountry, 14,900 acres as Frontcountry, and 7,640 acres as Rural. Consequently, a much greater portion of the Subunit is reserved for the Backcountry and Middlecountry activities of motorized use, when compared to the more Primitive activities of non-motorized use.

Effects from Travel Management

Effects would be similar to Alternative B, except more area would be made available for recreational activities that involve the summer-use of motorized travel. The Semi-Primitive Zone for this alternative, which limits summer motorized use except by permit, encompasses only three percent of the subunit (54,000 acres), compared to six percent in Alternative C, thirty percent in Alternative B and zero percent in Alternative A. These decisions could potentially diminish the recreational experience of users seeking a primitive, non-motorized type of experience, while increasing the area available for motorized use. Allowing this level of OHV use could potentially result in an increased occurrence of user conflict issues.

Effects from Special Designations

Under Alternative D, 546,000 acres would be designated as the Fortymile ACEC. Effects would be the similar as those discussed under Alternative B, except management in the ACEC would be less protective of caribou and Dall sheep habitat. Thus, less potential would exist for increasing wildlife numbers that have beneficial impacts on wildlife viewing and hunting.

Effects from WSR would be the same as Alternative C.

4.4.2.2.6. Cumulative Effects

The effects of past, present and future actions, including the demand for recreational use, changes to the landscape as a result of surface-disturbing activities, and area closures or restrictions for resource protection, could affect recreation management in the Fortymile Subunit.

The demand for recreational use in the Fortymile Subunit is anticipated to increase by ten to fifteen percent over the life of the plan, due to general population increases and increases in recreation-related technology. This use would occur for both motorized (such as OHV use, including snowmobiles) and non-motorized (such as hiking, backpacking, hunting, float-boating,

river-based recreation, camping, fishing, gathering of edible plants and berries) activities, resulting in an increase in resource damage and conflicts among recreationists involved in these activities.

Surface-disturbances resulting from forestry and mineral activities could cumulatively affect recreational users if activities were concentrated in heavily recreated areas and if activities overlapped in duration. Effects to recreation as a result of these cumulative effects may include the potential dislocation of wildlife for hunting and viewing purposes, and/or the alteration of scenic viewsheds.

Special designation, including ACECs and WSRs, would further protect the Fortymile Subunit, by increasing wildlife number that benefit wildlife viewing, hunting, and fishing opportunities. As the size and scope of these areas increase, opportunities for land- and water-based recreation uses that incorporate scenic viewsheds as part of the experience would also increase. However, as areas that require special management attention, to prevent irreparable damage to historic, cultural and scenic values, the need for additional restrictions could limit OHV use and other recreational activities.

Implementing any of the alternatives would not contribute to a significant change to recreational opportunities on public lands.

4.4.2.3. Travel Management Fortymile Subunit

Summary of Effects

Effects on travel management from the proposed alternatives would result in a wide range of possible outcomes. Site-specific measures to protect and preserve the recreation-resource base and other sensitive resource values, including fish and wildlife, soil, water, Special Status Species, and cultural and paleontological resources, could result in restrictions or emergency closures. Surface-disturbing activities, caused by forestry and mineral actions, could affect travel management through the expansion of the existing transportation network.

Alternative C would provide the greatest range of motorized and non-motorized recreation experiences, while protecting area resources and minimizing user conflicts. It would be followed by Alternative B, then D, with Alternative A having the most potential for resource impacts and conflict among users.

Table 4.9. Fortymile: Comparison of OHV Designations

Area Designation	Alternative							
	A		B		C		D	
	Acres	%*	Acres	%*	Acres	%*	Acres	%*
Year-round								
Undesignated	1,827,000	88	0	0	0	0	0	0
Open	0	0	0	0	0	0	0	0
Closed	0	0	0	0	0	0	0	0
Limited	249,000	12	2,076,000	100	2,076,000	100	2,076,000	100
Winter (October 15 through April 30)								
Limited: Cross-country use of vehicles 1,000 pounds curb weight and less allowed.	249,000 (1,500 lbs. GVWR and less)	12	2,076,000	100	2,076,000	100	2,076,000	100
Summer (May 1 through October 14)								

Area Designation	Alternative							
	A		B		C		D	
	Acres	% *	Acres	% *	Acres	% *	Acres	% *
Limited: Cross-country use of vehicles 1,500 pounds curb weight and less allowed.	249,000 (1,500 lbs. GVWR and less)	12	0	0	0	0	2,022,000	97
Limited: Use of vehicles 1,500 pounds curb weight and less, limited to existing routes (except for game retrieval).	0	0	0	0	1,956,000	94	0	0
Limited: use of vehicles 1,500 pounds curb weight and less, limited to existing routes.	0	0	1,459,000	70	0	0	0	0
Limited: Closed to OHV use.	0	0	617,000	30	120,000	6	54,000	3

*Percent of BLM-managed lands (2,076,000 acres) within the Fortymile Subunit.

4.4.2.3.1. Effects Common to All Alternatives

Effects from Land and Realty Actions

Under all alternatives, land use authorizations, such as leases and permits, could potentially result in additional development that may adversely affect those areas being managed for Primitive or Semi-Primitive recreation experiences. These effects may include impacts to visual resources, increased visitor encounters, and a diminished travel experience. Alternatively, such development could increase access to BLM lands. Effects would likely be minimal under all alternatives due to the lack of land use authorizations anticipated and the remote nature of many of the BLM lands.

Land tenure actions (disposal or acquisition of lands) would have little effect under any alternative. Although lands are identified for disposal under Alternatives B, C, and D, all of the lands proposed for disposal are small parcels that are isolated from other BLM lands. Land disposal would not substantially decrease the area of public lands available for travel activities.

Effects from Locatable Minerals

Under all alternatives, mineral development through the use of suction dredging or placer mining activities, has the potential to affect travel and transportation management through the expansion of the existing route network. The construction of winter roads and trails for mineral development would provide a direct benefit to OHV users through the enhancement of public access opportunities. These effects would be the highest under Alternatives C and D, and the lowest under Alternatives A and B.

Effects from Travel Management

Under all alternatives, travel management actions would continue to provide for a range of motorized and non-motorized recreation experiences, while protecting resource values and minimizing user conflicts. This comprehensive approach to travel management would allow the BLM to sustain and enhance travel opportunities and experiences, visitor access and safety, and resource conservation throughout all alternatives.

Although it was not practical to define or delineate a comprehensive travel management network during the land use planning process (due to incomplete route data, size, and complexity of the area), approximately 350 miles of existing and recently used summer routes were identified for continued management in the Fortymile Subunit (Maps 51, 52, and 53). Since all public lands are required to have off-highway vehicle area designations, Travel Management Zones (TMZs) were identified as *open*, *limited*, or *closed* under all alternatives. Areas identified as Open, permit vehicle use at all times, anywhere in the area subject to operating regulations and vehicle standards, however no areas in this subunit would be Open. Limited designations would restrict motorized vehicles to existing routes, weight, and/or season of use (Alternatives A, B, C and D). No areas will be classified as Closed within the Subunit; prohibiting off-road vehicle use year round.

Under all alternatives, non-motorized travel (e.g., float-boating, pedestrian, equestrian, and mechanized uses such as mountain bikes) would continue to be allowed on all BLM lands in the Fortymile Subunit (2,076,000 acres). There would be no change from current management, and opportunities would continue for visitors who access public lands by float-boat (including rafts, kayaks, and canoes), foot, horse, or bicycle.

Over-snow motorized travel (snowmobiles) would be assigned a Limited designation for all BLM-managed lands in the Fortymile Subunit (2,076,000 acres), maintaining travel opportunities for visitors during the winter months. Limitations to travel by snowmobiles include a weight restriction of 1,000 pounds curb weight and less, and Cross-country travel is allowed under all alternatives. Winter use of snowmobiles is generally restricted to between October 15 through April 30, though these dates could be extended or reduced on either end due to changing weather conditions.

Fixed-wing and helicopter access will remain largely unregulated in the Fortymile Subunit, unless specifically addressed through the development of a Recreation Activity Management Plan, ACEC Management Plan, or through additional regulations.

Effects from Special Designations

Under all alternatives, the Fortymile WSR (392 miles), as designated through ANILCA, would continue to be managed pursuant to the WSRA. Management of the river, per BLM guidance, would impact travel in the “wild” segments where the construction of new roads, primitive roads, trails, or other provisions for overland motorized travel would not be permitted (BLM 8351 Manual).

4.4.2.3.2. Alternative A (No Action)

Effects from Forest and Woodland Products

Current levels of firewood collection, commercial harvests, and forest products gathering have minimal effects on travel and transportation management. Applications for forest and timber projects are considered throughout the subunit. On the rare occasion that permits are issued, monitoring is done to ensure that the authorized amounts, locations, and stipulations of the permit have been followed. Proliferation of routes could occur, but stipulations for winter cutting or walk-in only would limit this impact. This could affect travel management through the expansion of the existing transportation network or if restrictions or emergency closures became necessary, to mitigate impacts to damaged areas.

Effects from Recreation

This alternative provides the most motorized public access of any of the alternatives, as OHV use would continue to be managed in accordance with existing OHV limitations. Travel within the Fortymile WSR Corridor would be limited to vehicles 1,500 pounds GVWR and less, while travel outside of the corridor would remain unrestricted, as there are no OHV designations in place. Thus, while this alternative would offer the most opportunities for recreational activities that involve the use of motorized travel, including hunting and OHV riding; fewer opportunities would exist for recreational users seeking a primitive, non-motorized type of experience.

Effects from Travel Management

This alternative would provide the most motorized and mechanized public access of any of the alternatives, as travel and transportation would continue to recognize 1,827,000 acres (eighty-eight percent) as “unrestricted” and 249,000 acres (twelve percent) as Limited. With no OHV designation in place outside of the Fortymile WSR Corridor, this alternative would provide the greatest opportunity for those users seeking cross-country motorized activities. Travel within the Fortymile WSR Corridor would continue to be limited to vehicles 1,500 pounds GVWR and less, as specified in the Fortymile River Management Plan (BLM 1983a). The Fortymile Management Framework Plan limited winter use to vehicles weighing 6,000 pounds or less and summer use to existing roads or trails.

For those travelers seeking non-motorized forms of transportation, the Fortymile Subunit would continue to be managed in support of its many waterways and non-motorized recreation trails, to provide opportunities of a more primitive nature. Motorized boat use would continue to be restricted on all non-navigable “wild” segments of the Fortymile WSR except under the provisions of 43 CFR 3809.

4.4.2.3.3. Alternative B

Effects from Forest and Woodland Products

Effects would be similar to those identified under Alternative A, except this alternative would restrict uses in some areas. Personal use of timber, commercial/salvage timber sales, and commercial use of forest products would not be allowed within the Fortymile WSR Corridor, the Eagle Recreational Withdrawal, and the Fort Egbert Historic Site. The potential for additional access routes or emergency closures would be lower. As in Alternative A, impacts would be reduced through permitting stipulations and monitoring.

Effects from Recreation

The ROS setting provides a framework for identifying the types of recreation activities that the public might desire, which is directly related to the travel and transportation management opportunities available in those areas. The ROS setting for this alternative would maintain seventy-eight percent of the Fortymile SRMA as available to non-motorized recreation opportunities and the winter-use of snowmobiles (1,000 pounds curb weight and less) (617,000 acres Semi-Primitive). The remaining twenty-two percent (164,000 acres Backcountry, 6,800 acres Middlecountry, 3,400 acres Frontcountry, and 840 acres Rural) would remain limited (i.e., 1,500 pounds curb weight and less, existing routes) to summer motorized-opportunities and would encourage a wide-variety of recreation uses and activities. Since RMZs and TMZs are delineated with the same boundaries under each alternative, impacts from recreation on travel

and transportation management are expected to be minimal, as zones were designed to interact with one another.

Effects from Travel Management

All BLM lands in the Fortymile Subunit would be designated as limited for OHV use. This would restrict OHV use to existing routes and vehicle weight (1,500 pounds curb weight and less) within 1,459,000 acres (seventy percent) during the summer. Approximately 617,000 acres of Semi-Primitive ROS class would be closed to summer use. Weight restrictions would be maintained for one-hundred percent of Subunit (2,076,000 acres) during the winter months. Thus, unlike Alternative A, this alternative would eliminate the free and unrestricted use of OHVs.

Restrictions would impact users by limiting OHV use where no limits have been in place before. Through limitations imposed on the summer-use of OHVs, there may be areas that users will have difficulty reaching (such as for game-retrieval) due to lack of existing routes. Consequently, this alternative would impact OHV and travel use more than any other alternative, as it would have a greater affect on non-local users who visit the area during the non-winter months when OHV use is most restricted.

Under Alternative B motorized boats with the exception of airboats, hovercraft, and personal watercraft would be allowed on all sections of the Fortymile WSR consistent with ANILCA sections 1110(a) and 811. Airboats, hovercraft, and personal watercraft would continue to be restricted on the non-navigable “wild” segments of the river. These allowances would increase the motorized use potential for the subunit, but would ultimately have little effect based on the natural barriers and vessel limitations needed to access these areas.

Effects from Special Designations

Under Alternative B, Gold Run and Dome Creek would be recommended as suitable for designation as WSRs. Impacts to travel management would be expected to be minimal, in Dome Creek as it would be designated as “recreational.” The BLM could modify existing routes and develop new trails within the river corridor as needed. Gold Run Creek could be added to the NWSR as a “wild” river where no construction of new roads, trails or other provisions for overland motorized travel would be permitted within the river corridor.

Approximately 732,000 acres would be designated as the Fortymile ACEC (Map 62) to protect caribou and Dall Sheep habitat. Management of this area could effect travel and transportation management if additional restrictions (i.e., seasonal, weight) were placed on OHV use and the construction of additional trails. However, impacts to travel are expected to be negligible, as the areas within the ACEC are remote and difficult to access.

4.4.2.3.4. Alternative C

Effects from Forest and Woodland Products

Slightly more lands would be available for forest harvest activities compared to Alternative B, including allowing personal use of timber and commercial forest product harvest in the “scenic” and “recreational” segments of the Fortymile WSR. Opening these relatively accessible areas to harvest, could potentially result in a higher likelihood of activity and resulting impacts.

Effects from Recreation

Similar to Alternative B, the BLM would continue to manage public lands for a variety of recreational activities within all ROS settings. Effects on travel and transportation management would be similar to those identified under Alternative B. Under this alternative, the ROS setting establishes forty-eight percent of the Fortymile SRMA as available to non-motorized recreation opportunities and the winter-use of snowmobiles (1,000 pounds curb weight and less) (120,000 acres Semi-Primitive). The remaining fifty-two percent (106,000 acres Backcountry, 11,500 acres Middlecountry, 10,200 acres Frontcountry, and 840 acres Rural) would remain limited (i.e., 1,500 pounds curb weight and less, existing routes except for game retrieval) to summer-motorized experiences and developed recreation activities. Thus, when compared to Alternative B, fewer opportunities would exist for recreational users seeking primitive, non-motorized experiences, while more opportunities would be available for recreational activities that involve the use of motorized travel.

Effects from Travel Management

Effects would be similar to those identified under Alternative B, except more area would be made available for travel activities that involve the summer-use of OHVs. This alternative would Limit OHV use to existing routes and vehicle weight (1,500 pounds curb weight and less), except for game removal, on 1,956,000 acres (ninety-four percent) during non-winter months, and maintain the weight restriction within one-hundred percent of Subunit (2,076,000 acres) during the winter months. Approximately 119,000 acres of Semi-Primitive lands would be closed to summer motorized travel. This would provide a direct benefit to recreational hunters who could retrieve legally harvested big-game animals off of pre-existing routes. As a result, impacts on travel management would be slightly less for this alternative, when compared to Alternative B.

Effects from Special Designations

Approximately 547,000 acres would be designated as the Fortymile ACEC (Map 63) to protect caribou and Dall Sheep habitat. Effects would be the similar as those discussed under Alternative B, except the ACEC would be smaller, and parts of the ACEC would be open to mineral exploration and development. If mining activity occurred, additional travel routes could be established and added to the trail network.

4.4.2.3.5. Alternative D

Effects from Forest and Woodland Products

Under Alternative D, personal use of timber and commercial use of forest products would be allowed throughout the subunit, except within the Eagle Recreational Withdrawal and the Fort Egbert Historic Site. Effects would be similar to Alternative C, even though slightly more lands would be open to personal use of timber, including the “wild” segments of the Fortymile River. The additional lands are not particularly accessible and use levels would likely not increase compared to Alternative C.

Effects from Recreation

Similar to Alternative C, the BLM would continue to manage public lands for a variety of recreational activities within all ROS settings. Effects on travel and transportation management would be similar to those identified under Alternative B. Under this alternative, the ROS setting establishes twenty-two percent of the Fortymile SRMA as available to non-motorized recreation opportunities and the winter-use of snowmobiles (1,000 pounds curb weight and less) (54,000

acres Semi-Primitive). The remaining seventy-eight percent (96,000 acres Backcountry, 77,000 acres Middlecountry, 14,900 acres Frontcountry, and 7,640 acres Rural) would remain limited (i.e., 1,500 pounds curb weight and less, cross-country travel) to summer-motorized experiences and developed recreation activities. Thus, while this alternative would offer the least opportunities for recreational users seeking primitive, non-motorized experiences, more opportunities would exist for recreational activities that involve the use of motorized travel, when compared to Alternatives B and C.

Effects from Travel Management

Under this alternative, all BLM-managed lands in the Fortymile Subunit would be designated as limited for OHV use. This would restrict OHV use to vehicle weights of 1,500 pounds curb weight and less on 2,022,000 acres (ninety-seven percent) during non-winter months, and maintain the weight restriction within one-hundred percent of Subunit (2,076,000 acres) during the winter months. This represents a departure from Alternatives B and C, as limited (i.e., 1,500 pounds curb weight) cross-country travel would be allowed on all BLM managed lands outside the SRMA and within Backcountry, Middlecountry, Frontcountry, and Rural Zones within the SRMA under this alternative. Approximately 54,000 acres of Semi-Primitive designated lands would be closed to summer motorized use. Thus, while a greater portion of the Subunit becomes available to motorized users under this alternative, less area becomes available for users seeking a primitive, non-motorized type of experience.

Effects from Special Designations

Approximately 546,000 acres would be designated as the Fortymile ACEC (Map 64) to protect caribou and Dall Sheep habitat. Effects would be the similar as those discussed under Alternatives C and D, except the entire ACEC would be open to mineral exportation and development. If exploration occurred, additional travel routes could be established and added to the travel network.

4.4.2.3.6. Cumulative Impacts

As is the case in much of Alaska, the majority of existing routes in the Fortymile Subunit are the result of user-created trails that follow historic non-recreational routes (such as, mining or administrative access) or were created by OHV users repeatedly driving cross-country. Accordingly, many of the existing routes are not sustainable from a resource management perspective, and can cause significant resource damage including, but not limited to, soil compaction, vegetation deterioration, or poor water quality. If not addressed, these impacts will continue to have an effect on travel and transportation management for years to come.

With increased pressures from growing populations and advances in recreational vehicle technology, the Fortymile Subunit is anticipated to experience similar growth in travel-related land use and activity participation. Since OHV use accounts for the majority of travel-related activities in the Fortymile Subunit, it is perceived that the demand for this activity will be of greatest concern during the life of the plan. Given its current rate of user increase (approximately ten percent per year), motorized-travel in the Fortymile Subunit could potentially double within the next 10 years. As this occurs, the need for additional trails and mechanisms for managing these trails will become necessary.

Lands adjacent to the BLM lands in the Fortymile Subunit are managed by federal (NPS), state, Native, and private entities. As a result, the rules and regulations governing the use of OHVs may differ slightly, when compared to the BLM lands in the region. For instance, while the

State of Alaska generally restricts OHVs to 1,500 pounds curb weight and allows cross-country travel in most areas as long as use does not cause or contribute to resource degradation. BLM will change its weight definitions from GVWR to curb weight to more closely align with state definitions, but open cross-country travel will only be allowed in one alternative. This may lead to some confusion, if riders are unaware that they have crossed the boundary of a different management agency or entity. Consequently, a proliferation of user-created trails could occur along the boundaries of the BLM lands. This effect could be higher in the Fortymile Subunit, as the BLM lands are more interspersed with state and private lands than in the other subunits.

4.4.3. Special Designations

4.4.3.1. Wild and Scenic Rivers Fortymile Subunit

Summary of Effects

Under all alternatives, the Fortymile WSR will continue to be managed to protect the free-flowing characteristics of the river, water quality, and Outstandingly Remarkable Values (ORVs). ORVs for the Fortymile River System are scenic, recreation, geologic, wildlife populations and habitat, and historic.

Management actions that protect the naturalness of the landscape such as wilderness characteristics, protection of fish and wildlife habitats, protection of vegetation and recreation management that manages for more primitive experiences will help protect many of the ORVs of the river system.

Alternative B is the only alternative where river segments are recommended for inclusion to the NWSR. Dome Creek and Gold Run are recommended with outstandingly remarkable historic values.

4.4.3.1.1. Alternative A (No Action)

No additional river segments are identified as suitable for inclusion to the NWSR. Under this alternative, the BLM would not recommend that Congress designate any river segments.

4.4.3.1.2. Alternative B

In general, this alternative anticipates a lower level of resource development and is the only alternative where river segments are determined to be suitable for inclusion to the NWSR. Under this alternative, the BLM would recommend that Congress designate each suitable river segment. This recommendation would influence the Congressional decision and increase the likelihood of permanent legislative protection. Decisions are evaluated for effect on identified Outstandingly Remarkable Values, free-flowing character and water quality.

Through the Wild and Scenic Rivers Inventory (Appendix E, *Wild and Scenic Rivers Inventory*) the BLM has determined which rivers and streams are suitable for inclusion in the NWSR. Two segments in the Fortymile Subunit were determined to be suitable: Dome Creek as “recreational” with outstandingly remarkable historic values; and Gold Run as “wild” with outstandingly remarkable historic values. All segments determined to be suitable must be managed for the protection of their Outstandingly Remarkable Values and free-flowing nature until such time as

Congress acts upon the determination finding and either designates the river segment or removes it from consideration. If the segment is removed from consideration by Congress, the BLM would manage the segment according to the management provisions of the RMP. The determination of suitability is a policy determination.

Effects from Cultural and Paleontological Resources

The protection of cultural resources would have a direct impact to outstandingly remarkable historic values. Destructive cultural resource data recovery and scientific use has the potential to directly impact outstandingly remarkable historical values. The removal of paleontological resources has the potential to directly and indirectly impact outstandingly remarkable historic values if the paleontological values are in close proximity to these historic values. Surface disturbance activities have the potential to directly and indirectly impact water quality.

Effects from Fish and Aquatic Species

Active rehabilitation efforts, such as willow plantings, seeding and fertilizing, recontouring the floodplain and returning the stream channel to a more natural functioning condition to areas with surface disturbance would have positive direct and indirect impacts to water quality on Dome Creek.

Effects from Soil, Vegetation, and Water Resources

Returning lands to pre-disturbance conditions would enhance water quality. Management of soil resources, vegetative communities, and watersheds for a properly functioning condition within riparian zones, uplands, wetlands and aquatic areas would directly and indirectly enhance water quality.

Effects from Visual Resources

“Wild” river segments would be managed as VRM Class I with the objective to preserve the existing character of the landscape and provide for natural ecological changes. Very limited management activities may occur where the level of change to the characteristic landscape is very low and must not attract attention. “Recreational” river segments would be managed as VRM Class III with the objective to partially retain the existing character of the landscape with moderate changes that repeat the basic elements found in the predominant natural features of the characteristic landscape. Management activities may attract attention, but should not dominate the view of the casual observer.

Effects from Wilderness Characteristics

The maintenance of wilderness characteristic would indirectly protect the free-flowing characteristics and water quality of the Gold Run segment.

Effects from Wildland Fire

Wildland fires have the potential to destroy or harm the outstandingly remarkable historic values.

Effects from Wildlife

Management of a naturally functioning ecosystem would directly and indirectly protect water quality. Restoration of riparian and wetland areas would directly and indirectly enhance water quality.

Effects from Lands and Realty

Consolidation of land ownership could indirectly enhance water quality by acquisition of lands adjacent to the river segments. Land use authorizations, such as leases and rights-of-way could indirectly and directly impact outstandingly remarkable historic values, directly impact free-flowing characteristics, and indirectly impact water quality if authorized across or along the river segments. Closing approximately 1,012,000 acres to locatable minerals would directly and indirectly protect water quality, free-flowing characteristics, historic values and naturalness or the river segments.

Effects from Locatable Minerals

The impacts from valid existing rights for the extraction of locatable minerals could directly impact outstandingly remarkable historic values and directly and indirectly impact water quality on Dome Creek. Modern mining methods could destroy the historic values. Depending on the methods used and size of operation, mining activities could impact the free-flowing characteristics of the river. Suction dredge operations would impact the water flow and change, at least temporarily, the river bed characteristics. These changes could alter the natural flow of the river segments.

Effects from Recreation

Gold Run is located within the Semi-Primitive North Fork Fortymile RMZ. Minimal facilities development would occur within this zone. Recreation users may visit historic sites in small groups and may impact outstandingly remarkable historic values. Facilities may indirectly impact water quality.

Dome Creek is located within the Backcountry Fortymile RMZ. Some facilities may occur within this zone and visitors may come in groups that average up to seven people. These slightly larger groups may visit historic sites and may impact outstandingly remarkable historic values. Facilities may indirectly impact water quality.

Effects from Travel Management

Unrestricted non-motorized travel could directly impact outstandingly remarkable historic values and water quality with the development of social travel routes. Unrestricted aircraft landings could indirectly impact water quality and Outstandingly Remarkable Values by allowing motorized access to historic sites.

Unrestricted winter motorized overland travel by OHVs weighing 1,500 pounds curb weight and less could indirectly impact water quality through the development of social routes and outstandingly remarkable historic values by allowing motorized access to historic sites. In Dome Creek, restricting summer motorized use by weight and to existing routes could indirectly impact water quality and Outstandingly Remarkable Values by allowing motorized access to historic sites. No summer motorized use is allowed in Gold Run.

Motorized travel could directly and indirectly impact water quality and Outstandingly Remarkable Values by allowing motorized access to remote areas.

Effects from Special Designations

Gold Run and Dome Creek would be recommended suitable for designation as WSRs. The designation of these rivers by Congress would provide for greater protection of overall river values and of outstanding remarkable river values specifically. The amount of protection is dependent on the classification of the river segment. Management of suitable rivers would be coordinated with the State of Alaska. Dome Creek is 4.7 miles long and has a 1,254-acre corridor. Gold Run is 4.1 miles long and has a 1,326-acre corridor.

Effects from Hazardous Materials

Environmental remediation activities, such as the removal of surface or buried wastes from abandoned sites and removal of contaminated soils, could directly and indirectly enhance water quality and outstandingly remarkable historic values depending on the location of these activities.

Effects from Subsistence

Harvest of subsistence resources such as timber and other forest products could directly and indirectly impact the outstandingly remarkable historic values if collection of these resources occurs at historic sites.

4.4.3.1.3. Alternative C

Same as Alternative A.

4.4.3.1.4. Alternative D

Same as Alternative A.

4.4.3.1.5. Cumulative Impacts

Past, present and reasonably foreseeable actions that are relevant to Wild and Scenic Rivers management include mining, oil and gas development, increases in motorized use on both water and adjacent lands, utility and transportation rights-of-way, recreation use, travel management, and use restrictions to protect wildlife, fisheries and vegetative resources.

Cumulative effects will accrue from the BLM management decisions in addition to activities on surrounding lands during and beyond the life of the plan. Most of the surrounding land base is either Native corporation or state and could be subject to resource development activities which may have a direct impact on water quality and other river related values. Development of lands along waterways could have an indirect impact on other rivers by increasing the importance of river related values of free-flowing, water quality, scenic, recreation, geologic, fish and wildlife habitats and populations, cultural and historic on those other rivers.

Designation and management of ACECs, and maintenance of wilderness characteristics, as well as measures to protect other resource values on adjacent federal lands, would help protect suitable rivers. Proposed and current management in these areas would limit development and help maintain a more natural ecosystem with benefits to water quality and other river related values.

Protection of river related values along the Fortymile WSR and the Charley River WSR (managed by the National Park Service), would continue. Protection of river related values along eligible rivers in the region, the Yukon and Seventymile, both managed by the National Park Service, would continue until a decision is made by Congress to not add them to the NWSR. Protection of

river related values along proposed additions, Dome Creek and Gold Run, would also continue if designated by Congress. The BLM and other agencies could implement other means to protect river values if these segments are not included in the system.

4.4.4. Social and Economic Conditions

4.4.4.1. Economics Fortymile Subunit

Summary of Effects

The largest economic effect in the Fortymile Subunit would be from mining. The proposed opening of new areas to mineral entry would result in the staking of new mining claims and additional suction dredging, small-scale placer, and large-scale placer mine operations in the Fortymile Subunit. Employment associated with mining activity on BLM-managed lands in the subunit is estimated at 1.4 percent of the current statewide mineral industry employment. Additional industry employment is less than two percent for any alternative. The effects would be the least under Alternative A and the greatest under Alternative D. New placer mining could increase the estimated employment in placer mining in the state by as much as twenty percent under Alternative D.

Table 4.10. Direct Employment and Income

Activity	Crew	Alternative A		Alternative B ^a			Alternative C			Alternative D		
		Current Operations	Current Jobs	New Op-erations	New Jobs	New Income (\$1,000)	New Op-erations	New Jobs	New Income (\$1,000)	New Op-erations	New Jobs	New Income (\$1,000)
Fortymile Subunit												
Suction Dredge	2	6	12	4	8	\$278,122	8	16	\$566,244	12	24	\$834,366
Small Placer	4	27	108	4	16	\$578,142	6	24	\$867,212	13	52	\$1,878,960
Large Placer	9	2	18	1	9	\$325,204	1	9	\$325,204	1	9	\$325,204
Total		35	138	9	33	\$1,181,468	15	49	\$1,748,660	26	85	\$3,038,530
Steese Subunit												
Suction Dredge	2	1	2	0	0	\$0	8	16	\$556,224	11	22	\$764,836
Small Placer	4	7	28	1	4	\$144,535	8	32	\$1,156,283	17	68	\$2,457,102
Large Placer	9	2	18	0	0	\$0	2	18	\$650,409	2	18	\$650,409
Total		10	48	1	4	\$144,535	18	66	\$2,362,916	30	108	\$3,872,347
Upper Black River Subunit												
Suction Dredge	2	0	0	0	0	\$0	0	0	\$0	0	0	\$0
Small Placer	2	0	0	0	0	\$0	0	0	\$0	0	0	\$0
Large Placer	9	0	0	0	0	\$0	0	0	\$0	0	0	\$0
Total		0	0	0	0	\$0	0	0	\$0	0	0	\$0
White Mountains Subunit												
Suction Dredge	2	0	0	0	0	\$0	0	0	\$0	0	0	\$0
Small Placer	4	3	12	0	0	\$0	0	0	\$0	0	0	\$0
Large Placer	9	1	9	0	0	\$0	0	0	\$0	0	0	\$0
Total		4	21	0	0	\$0	0	0	\$0	0	0	\$0

^aSources: Szumigala 2011, BLM 2009c, BLM 2011, McDowell 2006

4.4.4.1.1. Effects Common to All Alternatives

In addition to the effects discussed as common to all subunits in section 4.3.3.1, the following effects would occur in the Fortymile Subunit.

No revenues to the State of Alaska or the federal government would result from coal or oil and gas exploration. Similarly, no revenues would result from locatable mineral exploration and mining. Seismic exploration for oil and gas is unlikely on these low potential lands during the life of the plan. No economic effect would be anticipated under any alternative.

Effects from Locatable Minerals

Mining activity is predicted to result in large and small-scale placer and suction dredge operations in the Fortymile Subunit. This forecast is based on a study for the planning area that the BLM contracted with a mine cost engineering corporation (Stebbins 2009). The BLM chose to examine effects of large and small-scale placer, and suction dredge mining because decisions in this RMP propose to open some lands to new mining claims.

No mining claims would be filed, nor would mining activity occur until the ANCSA 17(d)(1) withdrawals are modified. The BLM anticipates this would take at least five years after approval of this RMP. In all cases, mines are assumed to operate for 10 to 20 years. No revenue to the federal government is expected.

Economists regard three categories of employment and income in considering the multiplier effect of an activity such as mining. Direct employment and income includes only employees of mining companies. Indirect employment and income includes employees of businesses providing goods and services to mining companies. These may include air taxi services and equipment. Finally, induced employment and income is considered when jobs are created as a result spending of direct and indirect income attributable to mining activity. An example of this is an additional retail store employee or schoolteacher.

Employment and income multipliers vary between projects and locations. McDowell (2006) shows widely varying multipliers for existing Alaska mines. Project activity has a lower effect on small communities than on the state. This is due to procurement from central sources in larger communities. For example, pumps are not available at retail in Eagle. These would likely be procured from Anchorage. Similarly, the multiplier effect will decrease in Alaska and a locality, when nonresident employment is significant. Tech Cominco reported hiring approximately twenty percent nonresident workers at Red Dog Mine in northwest Alaska in 2003. The analysis in this RMP uses McDowell (2006) employment and income multipliers for the Alaska mining industry.

All employment and income shown in this analysis are *estimated* using input and assumptions from the BLM (Stebbins 2009, BLM 2009c) and McDowell reports (2006 and 2009). For example, it is likely that employment estimates are slightly higher than may be verified from actual payrolls.

Economic base models stress exogenous (external) inputs. Income is generated by basic economic activity, whether it is mineral production for export to distant markets or tourism catering to outside visitors, and is seen as the driver of the local economy and, specifically, the local support and service industries that compose the non-basic sectors. Economic base models hypothesize a constant ratio between basic and non-basic activity. As a result, changes in basic sector activity can be directly linked to changes in non-basic activity through a static impact multiplier. For

every dollar of income earned in the basic sectors, economic base models assume additional dollars are earned in the non-basic sectors. The multiplier can then be used to predict changes in total community economic activity based on predicted changes in basic activity.

Economic base hypotheses are not valid in the towns of southeast Alaska, and, by extension, small, isolated communities elsewhere. First, an extremely high degree of income leakage in small communities means that impacts from changes in employment and income may appear outside the community in question. The effect of leakage, though theoretically consistent with the economic base hypothesis, may not be adequately accounted for in input/output modeling. Second, the economic base model inputs, notably labor, may be in error. This would help explain instances where changes in basic employment actually result in opposite changes in employment in other sectors of the local economy, as individuals move from job to job within a community (Robertson 2003). In summary, economic inputs multiplied best register effects on a regional and Statewide level.

4.4.4.1.2. Alternative A (No Action)

Effects would be limited to increase in currently allowed economic activities resulting from population growth.

Effects from Locatable Minerals

Alternative A would not allow new claims, as BLM lands are currently withdrawn from mineral entry by ANCSA 17(d)(1). There are, however, existing mining operations on 10,000 acres of valid, existing federal mining claims in the Fortymile Subunit. The following discussion for Alternative A is based on activities likely to occur on these existing claims. Mining activity is predicted to result in large and small-scale placer, and suction dredge operations in the subunit.

Suction dredge mining results in the least economic effect of any mining method. Portable and inexpensive equipment is used. The model developed for suction dredge mining in all locations involves a crew of two working 10 hours per day, seven days per week, 120 days per year. Based on six suction dredging operations, current employment is 12 workers.

Small-scale placer mining uses a bulldozer, and excavator and a mobile wash plant to excavate and process gold-bearing gravel. In this model, a two-man crew works 12 hours per day, seven days per week, for a 130-day season. The camp includes one support person and a cook for a total of four workers. Based on 27 small-scale placer mining operations, current employment is 108 workers.

Large-scale placer operations utilize larger excavation equipment than the small-scale placer mines. In this model, two 2-man crews each work a 10-hour shift, seven days per week, during a 130 day season. There are five additional employees, including a supervisor, skilled workers, and laborers for a total of nine workers. Based on two large-scale placer mining operations, the resulting employment is 18 workers.

Total current mining employment on BLM-managed lands in the Fortymile Subunit is estimated at 138 workers. However, these are part-year employees. Data prepared by the State of Alaska uses full-time equivalents. The full-time equivalent in the Fortymile Subunit is approximately 46 workers, based on the Stebbins (2009) models.

Total employment by the Alaska minerals industry in 2008 was 3,392 full-time equivalent jobs (Szumigala et al., 2009). This indicates about 1.4 percent of the industry employment on BLM-managed lands occurred at Fortymile operations. The DGGS reported the average monthly wage for mining in Alaska during 2008 at \$7,472 (Szumigala et al., 2009). Fortymile operations accounted for \$343,712 in monthly wages, annualized.

4.4.4.1.3. Alternative B

Effects from Locatable Minerals

Under Alternative B, 976,000 acres would be opened to locatable mineral entry in the Fortymile Subunit and new mining claims could be staked.

There would be 10 total suction dredging operations, an increase of four from Alternative A, the resulting employment would be eight additional workers. Small-scale placer mining would increase by four to a total of 31 operations. New employment would be 16 workers. One additional large-scale placer operation would open, for a total of three in the subunit. The resulting new employment would be nine workers.

Total new mining employment associated with BLM-managed lands in the Fortymile Subunit under Alternative B would be estimated at 33 part-year workers. The full-time equivalent would be approximately 11 additional workers, based on the Stebbins (2009) models. The DGGS reported the monthly wage for mining in Alaska during 2008 at \$7,472. New Fortymile operations would account for \$82,192 in monthly wages, annualized.

Indirect and induced employment and income would also result from new mining. These would be higher than under Alternative A. Refer to Table 4.10, "Direct Employment and Income" for Fortymile data and a comparison of all subunits and alternatives.

State of Alaska revenue from Mining License Tax and Corporate Income Tax would also be proportionally higher under this alternative.

4.4.4.1.4. Alternative C

Effects from Locatable Minerals

Under Alternative C, 1,468,000 acres would be opened to locatable mineral entry and the staking of mining claims.

There would be an estimated 14 suction dredging operations, an increase of eight from Alternative A. The resulting employment would be 16 additional workers. Small-scale placer mining would increase by six to a total of 33 operations. New employment would be 24 part-year workers. The number large-scale placer mines would be three, the same as Alternative B. The resulting new employment would be nine workers.

Total new mining employment in the Fortymile Subunit under Alternative C would be estimated at 49 part-year workers. The full time equivalent would be approximately 16 additional workers, based on the Stebbins (2009) models. The DGGS reported the average monthly wage for mining in Alaska during 2008 at \$7,472. New Fortymile operations would account for \$119,552 in monthly wages, annualized.

Indirect and induced employment and income would also result from new mining. These outputs would be higher for Alternative C than Alternative B. See Table 4.10, “Direct Employment and Income” for Fortymile data and comparison of all subunits and alternatives.

State of Alaska revenue from Mining License Tax and Corporate Income Tax would also be proportionally higher under this alternative and higher than under Alternative B.

4.4.4.1.5. Alternative D

Effects from Locatable Minerals

Under Alternative D 1,921,000 acres in the Fortymile Subunit would be opened to locatable mineral entry and staking of new mining claims.

There would be 18 total suction dredging operations, an increase of 12 from Alternative A. Resulting employment would be 24 additional workers. Small-scale placer mining operations would increase by seven to a total of 34. New employment associated with small-scale placer mines would be 28 workers. The number of large-scale placer mining operations (three) would be the same as Alternative B. The resulting new employment associated with large-scale placer mines would be nine workers.

Total new mining employment in the Fortymile Subunit under Alternative D would be estimated at 61 part-year workers. The full-time equivalent would be approximately 20 workers, based on the Stebbins (2009) models. The DGGs monthly wage for mining in Alaska during 2008 at \$7,472. New Fortymile operations would account for \$149,440 in monthly wages, annualized.

Indirect and induced employment and income would also result from new mining. These outputs would be higher for Alternative D than Alternative B or C. See Table 4.10, “Direct Employment and Income” for Fortymile data and comparison of all subunits and alternatives.

State of Alaska revenue from Mining License Tax and Corporate Income Tax would also be proportionally higher under this alternative and higher than under Alternatives B or C.

4.4.4.2. Environmental Justice Fortymile Subunit

Summary of Effects

Effects to the environmental justice population in the Fortymile Subunit are expected to be low. Increased employment opportunity caused by recreation use or mining activity could benefit environmental justice populations. This includes the communities of Chicken, Eagle, and Eagle Village.

4.4.4.2.1. Effects Common to All Alternatives

There will be little or no economic effect resulting from the following resources, resource uses, or programs: Forest and Woodland Products, Lands and Realty, Leasable Minerals, and Renewable Energy.

Effects from Locatable Minerals

Mining of locatable minerals could result in additional jobs and income to local residents in the environmental justice population. These effects would be very low and apply only to alternatives B, C, and D. See Table 4.10, “Direct Employment and Income” for total direct employment and income for all alternatives.

4.4.4.2.2. Alternative A (No Action)

There would be no effects.

4.4.4.2.3. Alternative B

There would be no effects other than those from locatable minerals discussed under Effects Common to All Alternatives.

4.4.4.2.4. Alternative C

Same as B

4.4.4.2.5. Alternative D

Same as B except the number of Special Recreation Permits would be slightly higher under Alternative D. Environmental justice effects to communities in the area may be positive if employment in guiding or associated activities accrues to local populations.

4.4.4.3. Social Conditions Fortymile Subunit

Summary of Effects

Most impacts to individuals and groups are minor to moderate in part because other opportunities exist for the activities within the planning area and on nearby State of Alaska or Native corporation lands. While it is possible for impacts for multiple resources to adversely affect individuals and groups in a cascading fashion, most communities exhibit sufficient resiliency to adapt to change.

The following programs would have minor net positive or negative effect to social conditions and are not analyzed further: Air, Cave and Karst Resources, Cultural and Paleontological Resources, Fish and Aquatic Species, Soil Resources, Special Status Species, Vegetative Communities, Visual Resources, Water Resources, Wilderness, Wildland Fire Ecology and Management, Wildlife, Fluid and Solid Leasable Minerals, Salable Minerals, Recreation, Travel Management, and Special Designations. For further discussion, see Effects Common To All Alternatives in all Subunits.

4.4.4.3.1. Effects Common to All Alternatives

Effects from Forest and Woodland Products

Residents in the town of Eagle live close to BLM lands, which could be a convenient source of firewood. This land is part of the Fort Egbert Historic Site and BLM's campground, so is unavailable for firewood collection. This protects the natural and historic nature of the land.

Effects from Land and Realty; Locatable Minerals

The community of Chicken centers on mining, so limitations on mineral entry will result in increased pressure to mine State of Alaska lands or reduce community viability. At present, community character and values are determined by the link to mining and winter closure of the town. Extensive withdrawals have limited this activity within the planning area. To the extent that withdrawals exist, mining would cease to be an aspect public land use in the area. No remnant activities would occur on public land to give context to the various displays of the mining era. Reduced opportunities for participation at a lifestyle or recreational level would reduce individual well being, and community well being in Chicken.

Effects from Subsistence

Preventing or reducing placer mining may improve subsistence catches of some fish species. This will increase the sense of well being among populations targeting such species, and will increase food security if other food sources are displaced by wildland fire, climate change, or other factors.

4.4.4.3.2. Alternative A (No Action)

Effects from Land and Realty; Locatable Minerals

The Eagle Recreation Site withdrawal is adjacent to Fort Egbert and nearby historic structures, so retention of the withdrawal helps maintain the character of the site and community. This contributes to the community both in support of efforts to develop tourism opportunities and maintaining the historic landscape that is part of the sense of place many local inhabitants experience.

Effects of maintaining ANCSA 17(d)(1) withdrawals may be decreased mining activity, eroding the community character and well being of communities in the subunit, such as Chicken. The extent of activity will be determined by the mineral potential of the available lands.

4.4.4.3.3. Alternative B

Effects from Land and Realty; Locatable Minerals

As in Alternative A, maintaining the Eagle Recreation Site withdrawal contributes to community economic activities and sense of place.

Effects of lifting ANCSA 17(d)(1) withdrawals may be increased mining activity and increased diversity of operations, enhancing the community character and well being of communities in the subunit, such as Chicken. Since nearly half of the acreage in the subunit will be available to mining, those that value resource protection, some recreationists, and perhaps other groups may experience some decline in quality of life either directly in their activities, or indirectly.

4.4.4.3.4. Alternative C

Effects from Land and Realty; Locatable Minerals

As in Alternative A, maintaining the Eagle Recreation Site withdrawal contributes to community economic activities and sense of place.

Effects of lifting ANCSA 17(d)(1) withdrawals may be increased mining activity and increased diversity of operations, enhancing the community character and well being of communities in the

subunit, such as Chicken. Since seventy percent of the acreage in the subunit will be available to mining, those that value resource protection, some recreationists, and perhaps other groups may experience a more significant decline in quality of life either directly in their activities, or indirectly.

4.4.4.3.5. Alternative D

Effects from Land and Realty; Locatable Minerals

Disposal of Eagle Recreation Site withdrawal may change the character of the lands adjacent to Fort Egbert and Eagle, which may result in a net decrease in quality of life for some residents by altering their sense of place, and for some visitors by detracting from the historic setting of the fort.

Effects of lifting ANCSA 17(d)(1) withdrawals may be increased mining activity and increased diversity of operations, enhancing the community character and well being of communities in the subunit, such as Chicken. The extent of activity will be determined by the mineral potential of the available lands. Increased activity would result in new employment of 85 seasonal workers and over \$3 million in personal income for the employees, providing a significant economic infusion to an area with few employment opportunities. That may result in an increased well being and sense of security for those employees and area merchants. The effects may include increased traffic, higher home prices, and other consequences that result in a decreased well being and quality of life for other members of the community. Since ninety-two percent of the acreage in the subunit will be available to mining, those that value resource protection, some recreationists, and perhaps other groups may experience a significant decline in quality of life either directly in their activities, or indirectly.

4.4.4.4. Subsistence Fortymile Subunit

Summary of Effects

Current uses of BLM lands consist primarily of placer and suction dredge mining, non-motorized recreation, and subsistence activities. All residents of the subunit living outside of the Fairbanks North Star Borough boundaries qualify as rural residents under ANILCA and are eligible to harvest resources under the subsistence program on federal lands. Nine communities are within the subunit: Eagle, Eagle village, Chicken, Northway, Tetlin, Tok, Tanacross, Dot Lake, Healy Lake and Delta Junction and are the primary federally qualified subsistence users of the area.

Impacts from authorized land use activities include user conflicts, displacement of resources, and potential declines in resource availability due to disturbance of critical habitats or during critical times (e.g., calving periods). Alternative D, which allows the most latitude to development and OHV use, would have the greatest potential to negatively affect subsistence resources and uses. Alternative B, which limits land use activities the most, would confer the highest levels of protection to subsistence resources and uses. Where permits for summer use of OHV are required, such as in Semi-Primitive and Backcountry Recreation Management Zones, residents participating in federal subsistence harvest between May 1 and October 14 would need a permit. The permit requirement would be considered a “reasonable regulation” under ANILCA Title VIII Section 811(b).

Data used in this section are from the following sources. Caulfield (1979) documented current and historic subsistence use by residents of Eagle and Eagle Village. Halpin (1987) documented

subsistence use by residents of Tetlin for the time period 1974 –1984. Case (1986) documented use for Northway from 1974 - 1984. Martin (1983) documented use for Dot Lake from 1946–1982. Marcotte (1991) documented subsistence use by residents in the communities of Dot Lake, Tanacross, Tok, Tetlin and Northway for 1968–1988. Caulfield (1979) documented current and historic subsistence use by residents of Eagle and Eagle Village. Use areas documented in these studies are minimum use areas and reflect in some cases the current use over a 10 year period to the lifetime use of those interviewed.

Caribou, primarily Fortymile caribou, moose and salmon are the most important subsistence resources in the subunit. Trapping continues to be culturally and economically important to many federally qualified subsistence users in the area.

Most subsistence fishing by rural residents in the Fortymile Subunit occurs on the Tanana or Yukon rivers and in lakes and ponds off BLM-managed lands. Land use activities permitted in the subunit, such as development of transportation corridors and locatable minerals, may affect water quality and fish spawning or rearing areas at downstream locations. This may indirectly impact subsistence fisheries harvested off BLM-managed lands. Stipulations to mitigate impacts to water quality and fish spawning and rearing areas are attached to land use permits as appropriate. No impacts to subsistence fishery resources or uses in or adjacent to BLM-managed lands are expected from the alternatives.

Subsistence activities documented to occur by local rural residents on BLM managed lands include hunting of moose and caribou (Tanacross, Tok, Northway), bear (Tanacross), and small game (Tanacross, Tok), trapping (Tanacross, Tok, Northway) and berry picking (Tanacross, Tok, Northway). These activities occur primarily along the Taylor Highway. In most cases, bear are harvested incidentally to other subsistence activities, such as moose hunting or fishing (Case 1983). Martin (1983) and Halpin (1987) document no subsistence use by Dot Lake or Tetlin on BLM-managed lands in the subunit. (NOTE: Data sets for Tetlin and Dot Lake show use of mammals by Tetlin and Dot Lake along Taylor Highway.)

4.4.4.4.1. Effects Common to All Alternatives

Effects from Forest and Woodland Products

Management decisions for commercial timber sales are common to all action alternatives. No commercial timber sales would be allowed within the Fortymile WSR Corridor, The Eagle Recreation withdrawal and the Fort Egbert Historic Site (249,000 acres) under Alternatives B, C or D. Commercial timber sales would be considered on all remaining lands. Demand for commercial timber in the subunit has been lacking and no impacts to subsistence resources or uses are expected from commercial timber sales under any of the alternatives.

Lands open to personal use of timber, and commercial product and timber salvage sales varies by alternative. Demand for personal use and salvage sales has been lacking and would be anticipated to be low over the life of the plan. No impacts to subsistence resources or uses would be anticipated from these resource uses.

Demand for commercial products, particularly mushrooms, can be fairly high after wildland fires. The fire return intervals are such that no significant impacts to subsistence resources or activities are expected. Salvage activities are usually linked to wildland fire events.

Effects from Land and Realty Actions

Exchange, disposal or acquisition of lands would have minimal and mostly beneficial impacts to subsistence resources and uses. The BLM lands considered for these actions are intermingled with other lands or are small isolated parcels. Consolidation of these would simplify identification of land status for subsistence and other users and land management would be consistent across a larger area.

The BLM has received few rights-of-way applications in the past and a limited number would be anticipated in the future. Proposed rights-of-way would be analyzed under NEPA and measures to mitigate impacts would be attached to authorizing permits.

The location and amount of withdrawn lands to be revoked varies by subunit and alternative. Revocation of withdrawals, other than ANCSA 17(d)(1) mineral entry and location, will be minimal and impacts are expected to be the same under all alternatives.

Effects from Leasable Minerals

No impacts to subsistence resources or uses are anticipated from oil and gas exploration, drilling, development or related activities under any alternative. Due to low potential for occurrence of economically recoverable oil and gas resources on BLM lands within the subunit, no activity is expected. Any exploration that might be proposed would require a permit and impacts would be mitigated through permit stipulations.

No impacts to subsistence uses or resources will occur from exploration or development of coal or other solid leasable minerals in the Fortymile Subunit under any alternative. No coal development will occur in the subunit because a decision for coal leasing is deferred under this plan. An amendment to the RMP would be required before coal leasing could be authorized.

Effects from Salable Minerals

Although the amount of land open to salable minerals varies by alternative, the demand for salable mineral materials would not vary. Material sites would be concentrated along the highway and adjacent to areas of end use. There would be minimal impacts to subsistence under any alternative. Impacts would be mitigated through permit stipulations. Most demand is expected to be met on state lands and few mineral sales are anticipated on BLM lands.

Effects from Recreation

Recreation use is concentrated along segments of the Fortymile WSR where canoes, rafts and kayaks can be easily launched and taken off the river from road accessible sites. The demand for Special Recreation Permits (SRP) in the Fortymile Subunit remains fairly low, with the current administration of only one active SRP for guided river trips. Affects from these recreational uses would be consistent among the alternatives and have no impact on subsistence resources or uses. Although recreation in general may be increasing in the area, much of it is guided by travel management prescriptions which are discussed below.

Recreational hunting occurs on BLM lands, but occurs predominantly on state lands. State hunting regulations manage recreational hunting on and off BLM-managed public land. Hunting pressure on adjacent lands would impact subsistence use and availability of resources on BLM lands regardless of the BLM recreation management prescriptions.

Some sport fishing occurs within the Fortymile WSR, but has no impacts on subsistence resources or uses in the area. Similar to hunting, regardless of BLM recreation management, the influence of sport fishing on subsistence uses and resources would be unchanged.

Effects from Travel Management

Interim alternatives for travel management include a range of limits on OHV use including weight limitations, permit requirements, designated routes, and seasonal limitations. Limitations on OHV may benefit subsistence uses, resources and environmental services (e.g., water) by protecting soils and vegetation from ground disturbance, rutting and erosion, and protecting water quality. Limitations on use would reduce direct impacts on resource abundance, distribution and location. Permitting use would provide opportunities to develop stipulations to mitigate impacts.

In each alternative a part or all of the BLM lands within the Fortymile Subunit will be managed as limited to vehicles 1,500 pounds curb weight and less without a permit or approved Plan of Operations. The size of the affected area varies based on boundaries of the Semi-Primitive Zones. Within Semi-Primitive Recreation Management Zones, summer use of OHVs 1,500 pounds curb weight and less will be by permit only. Use of OHV over 1,500 pounds curb weight would require a permit in all zones. New transportation and utility systems (including airstrips) and relocation of existing roads may be authorized under certain conditions in all alternatives.

In areas closed to motorized vehicles, federally qualified subsistence users, subject to reasonable regulation and with a free permit, can use snowmobiles, motor boats, airplanes, or other means of surface transportation for subsistence purposes as allowed under ANILCA Section 811 (see section 2.4.2.7 Travel Management).

4.4.4.4.2. Alternative A (No Action)

Under the No Action Alternative, present land management practices and levels of resource used would continue in accordance with existing laws, regulations, and policy. Land use activities would continue to be analyzed through the NEPA process and include ANILCA Title VIII Section 810 evaluations. Through these processes, appropriate stipulations would be developed to mitigate any impacts identified.

Effects from Forest and Woodland Products

Subsistence use of forest products are harvested under free-use permits (Nonsale Disposals Act 1878, amended for Alaska 1898 and 1938). Personal use woodland products (e.g., berries, bark and mushrooms) does not require a permit. No impacts to subsistence use of timber, berries and other forest products are expected from Alternative A.

Effects from Land and Realty

No designated utility corridors or right-of-way avoidance areas are identified in Alternative A. Without designations, a web of rights-of-way could result, impacting habitats upon which subsistence resources depend. However, few to no applications for rights-of-way are expected over the life of the plan. Long-term camping would continue to be allowed within “scenic” and “recreational” segments of the Fortymile WSR. No significant impacts to subsistence resources or uses are expected from the decisions in this alternative.

Effects from Locatable Minerals

The entire Fortymile Subunit is withdrawn from mineral entry under ANCSA 17(d)(1). Mining is occurring only on valid existing claims that predate the withdrawals. Extraction practices for locatable minerals result in removal of vegetation and overburden impacting wildlife and fish habitat. Activities associated with mining would temporarily displace wildlife until suitable vegetative communities are restored. Mining operations would be analyzed under NEPA and would include reclamation practices to restore riparian function and reduce potential for erosion and siltation. Impacts on subsistence resources or uses would be minimal based on this mitigation.

Effects from Travel Management

Within the Fortymile WSR Corridor, OHV use is limited to vehicles 1,500 pounds curb weight and less without a permit or approved Plan of Operations. Outside the corridor use is limited to vehicles 6,000 curb weight and less without a permit or approved Plan of Operations. Motorized boats can be used on the “scenic” and “recreational” segments of the river, but only on “wild” segments under provisions of 43 CFR 3809. Travel outside the corridor is not restricted and no OHV designations are in place. Many federal lands in the subunit important to subsistence use are accessible by OHV. Some impacts to wildlife and habitat occur from cross-country use of OHV during summer use. Impacts to subsistence are difficult to mitigate since most cross-country use can occur without authorization.

4.4.4.4.3. Alternative B

Effects from Forest and Woodland Products

Subsistence use forest products are harvested under free-use permits. Free-use permits would not be issued for personal use of timber within the Fortymile WSR Corridor (248,000 acres), the Eagle Recreational withdrawal, and the Fort Egbert Historic Site. On all other BLM lands, free-use permits for personal use of timber would be considered. Demand for personal use of timber has been lacking in the subunit and would be anticipated to be low over the life of the plan. No impacts to subsistence resources or uses would be anticipated from uses of any forest and woodland products.

Effects from Lands and Realty

No long-term camping would be allowed in the Fortymile WSR Corridor (248,000 acres). Where camping is not allowed, camps associated with state mining claims are often established below mean high water, contributing to additional bank erosion and degradation. Direct impacts to subsistence fishery uses and resources is expected to be low since little or no subsistence fishing is documented to occur within the Fortymile or other federal public lands in the subunit. The Fortymile system is not a significant spawning or rearing area for fish populations important to subsistence and little or no impact within the area would be expected. Downstream effects from siltation could result in indirect impacts to spawning and rearing habitat outside BLM lands.

Designating the Fortymile WSR and Fortymile ACEC as right-of-way avoidance areas would protect important wildlife habitat and resources from fragmentation caused by rights-of-way and by reducing disturbance to wildlife. However, since few rights-of-way are anticipated in these remote areas, the effect of the avoidance area would be limited.

Effects from Locatable Minerals

Approximately half of the BLM lands would be open to locatable minerals. The mineral potential is low for substantial portions of the open areas. However, some development would be likely to occur. Extraction practices for locatable minerals result in removal of vegetation and overburden from large areas impacting wildlife and fish habitat. Activities associated with mining would temporarily displace wildlife until suitable vegetative communities are restored. Mining operations would be analyzed under NEPA and ROPs would include reclamation practices to restore riparian function and reduce potential for erosion and siltation. Impacts would be higher than Alternative A as more lands are open to mining.

The Fortymile caribou herd is one of the most important subsistence resources in the area. The general calving range of the herd over the last 16 years will remain mostly closed to mineral location and entry under this alternative. The calving period is the most critical time of the year since pregnant cows are at the lowest ebb of physical condition and largest energy deficit, thus protecting the calving range is also critical.

Effects from Travel Management

This alternative offers the best protection to subsistence resources by limiting summer use of OHV on 1,459,000 acres (undesignated recreation areas, Backcountry, Middlecountry, Frontcountry and Rural RMZs) to existing routes only and to vehicles 1,500 pounds and less curb weight. All other forms of OHV use within these zones would require a permit or approved plan of operation. Additionally, in the Semi-Primitive RMZs (617,000 acres) a permit would be required for all but non-motorized and winter OHV use. Access for federally qualified subsistence users is discussed in the common to all alternatives (section 2.4.2.7 Travel Management).

Many trails begin on and lead to BLM lands that are important to subsistence and other users. Impacts to subsistence resources would still occur but would be less than under the other alternatives because limiting use to existing trails reduces disturbance from user-pioneered trails and protects against disturbance to wildlife, fish and important habitats. Where permits would be required, stipulations would be attached to mitigate impacts to subsistence resources and uses.

Motorized boat use would generally be allowed throughout the subunit, although airboats, hovercraft and personal watercraft would not be permitted on some non-navigable river segments (Table 2.8 Fortymile Subunit: Summary of Action Alternatives, Travel Management). Restricting use of airboats, hovercraft and personal watercraft in some areas will benefit subsistence resources by reducing direct and indirect disturbance to resources and habitats in these more remote areas.

4.4.4.4. Alternative C

Effects from Forest and Woodland Products

Subsistence use forest products are harvested under free-use permits. Free-use permits would not be issued for personal use of timber within the “wild” segments of the Fortymile WSR, the Eagle Recreational withdrawal, and the Fort Egbert Historic Site (146,000 acres). Demand for free-use permits has been lacking and would be anticipated to be low over the life of the plan. No impacts to subsistence resources or uses would be anticipated from uses of any forest and woodland products.

Effects from Lands and Realty

Alternative C is the same as Alternative A. Long-term camping associated with state authorized suction dredge mining would be allowed in all but the “wild” segments of the WSR corridor. Most camps associated with suction dredging would be located above ordinary high water. Indirect impacts to subsistence fishery and wildlife resources would be minimal.

No transportation corridors or right-of-way avoidance areas would be designated. Impacts to subsistence resources and uses are expected to be minimal but would be mitigated through stipulations to the authorization. Demand for rights-of-way has been and is expected to be low over the life of the plan.

Effects from Locatable Minerals

Seventy percent of BLM lands would be open to locatable minerals under Alternative C. The mineral potential is high for portions of the open areas. Impacts would be much the same as Alternative B, but with more acres of habitat being disturbed. Mitigation of impacts would be the same as for Alternative B.

Effects from Salable Minerals

Impacts on subsistence resources and uses would be the same as Alternative B except that slightly more acreage will be available for material site sales. Mitigation of impacts would be the same as Alternative B.

Effects from Travel Management

Alternative C differs from Alternative B in the location and size of the RMZs and that off-route travel for game retrieval is allowed in all areas except the Semi-Primitive RMZ, which is all but 120,000 acres of the BLM public lands in the subunit. Fortymile caribou are an important subsistence resource in and adjacent to BLM lands. Hunting for Fortymile caribou is important to all hunters. Demand and competition is high and concentrated along the highway and trails, often resulting in emergency and special actions to close the hunt far ahead of the normal season end. Being able to retrieve game off trail could attract more users and increase conflicts. Impacts to subsistence opportunity could be considerable. However, most harvest occurs off BLM lands, so this decision is not expected to impact opportunity for federally qualified subsistence hunters under ANILCA.

Impacts from the use of motorized watercraft is the same for Alternative C as for Alternative B except that the Gold Run suitable segment is open to use for airboats, hovercraft and personal watercraft.

4.4.4.4.5. Alternative D

Effects from Forest and Woodland Products

Subsistence use forest products are harvested under free-use permits. Free-use permits would not be issued for personal use of timber within the Eagle Recreational withdrawal, and the Fort Egbert Historic Site (840 acres). No impacts to subsistence resources or uses would be anticipated from uses of any forest and woodland products under this alternative.

Effects from Lands and Realty

Long-term camping would be allowed in all segments of the Fortymile WSR. All camps associated with suction dredging could be located above ordinary high water. Impacts to subsistence resources would be the same as Alternatives A and C.

Effects from Locatable Minerals

Approximately ninety-two percent of BLM lands would be open to locatable minerals under Alternative D. The mineral potential rank is high for portions of the open areas. Impacts would be much the same as for Alternative C but with more acres of habitat being disturbed. Mitigation of impacts would be the same Alternative B.

Effects from Salable Minerals

Impacts on subsistence resources and uses would be the same as Alternative B except that ninety-two percent of BLM-managed lands in the subunit would be available for material site sales. Mitigation of impacts would be the same as Alternative B.

Effects from Travel Management

Alternative D differs from Alternative B in the location and size of the RMZs and that cross-country summer use of OHV ($\leq 1,500$ pound curb weight) would be allowed in all areas except 54,000 acres in the Semi-Primitive RMZ. Alternative D would have the highest potential of the action alternatives for impacts through altering availability, distribution and abundance of subsistence resources, especially caribou and moose. Cross-country summer use is likely to attract even more hunters and may result in increased use in the undesignated recreation areas and more competition for resources. However, it is anticipated that most of the hunting pressure will still occur off BLM lands, and the travel management decisions in this alternative would have little impact.

Impacts from the use of motorized watercraft is the same as Alternative C.

4.4.4.4.6. Cumulative Effects

The effects of past, present and future actions, including the demand for subsistence resources, recreational uses and changes to the landscape as a result of surface-disturbing activities, could affect subsistence uses in the Fortymile Subunit. The demand for resources important for subsistence uses in the Fortymile Subunit is anticipated to increase over the life of the plan, due to general population increases and advances in OHV technology. Impacts include real or perceived conflicts among uses and potential loss of opportunity, either from changes in availability of or access to the resources.

Surface-disturbances resulting from realty and land use, forestry, and mineral extraction activities could cumulatively affect availability, abundance and distribution of subsistence resources if activities altered riparian function or were in areas and conducted during seasons important to these resources, such as in calving and post-calving areas and/or periods.

The combination of ongoing locatable mineral development occurring on state, federal and private lands in the subunit and future development projected for the subunit, would have cumulative impacts on Fortymile caribou (see wildlife discussion in this chapter). The privatization of State of Alaska or Native corporation lands could lead to additional development. Depending on the location of development, these impacts could include: short- or long-term disturbance to caribou

calving habitat, insect relief habitat, and migratory routes; disruption of caribou movements; stress and disturbance impacts to caribou during all seasons of the year; and possible reductions in herd productivity. If extensive activity occurred within the calving grounds or crucial insect relief habitat, these impacts could be significant.

Development of access roads and trails within the planning area would have the potential to negatively affect wildlife, and thus affect subsistence. These impacts would include habitat fragmentation, increased access into wildlife habitats, increased disturbance impacts, increased potential for mortality and possible alteration of behavior or movement patterns of wildlife. This may also result in an increase in recreational use of the area, resulting in additional competition with federally qualified subsistence users for resources.

Special designation, including ACECs and WSRs, would further protect habitats and subsistence opportunities in the Fortymile Subunit. Implementing any of the alternatives in this plan would not contribute to significant cumulative impacts to subsistence opportunities on public lands.

A more detailed analysis of the cumulative case is discussed in Appendix J, section J.2.1.5.

4.5. Impacts Specific to the Steese Subunit

4.5.1. Resources

4.5.1.1. Cultural and Paleontological Resources Steese Subunit

Summary of Effects

See section 4.3.1.3 Effects Common to All Alternatives, Impacts Common to All Subunits.

4.5.1.1.1. Alternative A (No Action)

Effects from Lands and Realty

Four transportation corridors were established in the Steese NCA to provide access to existing and potential mining areas. All rights-of-way will, as far as possible, be located in one of these corridors. Existing trails and roads will be followed as much as possible. Although the intent is to keep rights-of-way within these designated corridors, such authorizations could be approved outside of the corridors.

The approval of new roads or trails, either within or outside of these corridors, as with all such surface-disturbing activities, would have the potential to directly and adversely impact all manner of cultural and paleontological resources. In addition, there could be an indirect effect on surficial cultural resources; with the creation of new routes of access, more resource use permittees would have access to areas which were previously inaccessible. There would be an increased potential of more people finding surface cultural resources and potentially adversely impacting them, either intentionally or unintentionally.

Effects from Locatable Minerals

The entire Steese Subunit (including the Steese NCA) 1,275,000 acres, is currently closed to new locatable mineral entry and mineral leasing. There are 7,000 acres of valid existing federal claims inside the subunit, with mining presently occurring on some of these claims. Of these 7,000 claims, 5,000 are within the Steese NCA.

Most, if not all, locatable mineral mining that presently occurs is surface-disturbing, open-air mining, and not underground mining which is accessible through shafts and adits that would otherwise leave the upper ground surface undisturbed. As such, locatable mineral mining does directly and adversely impact all manner of cultural and paleontological resources.

Three types of placer mining operations occur in the subunit: (1) suction dredge operations, where the only surface disturbance relates to the supporting camp, (2) small-scale placer mines, where disturbance is limited to less than five acres per operation, with an assumed total area of 20 to 30 acres for the life of each mine, and (3) large-scale placer mines, where disturbance is estimated at five to twenty acres per operation, with an assumed total area of 60 to 80 acres for the life of each mine.

Further assumptions for locatable minerals for Alternative A in the Steese Subunit indicate one suction dredge operation in any given year, seven small-scale placer mines, and two large-scale mines. This equates to 286 to 374 acres of disturbed ground, in areas that very likely contain

evidence of prior, historic mining operations, which have occurred in some drainages in the Steese Subunit for about 130 years. Much of this disturbance would likely occur in the Steese NCA because the majority of the existing claims are within the NCA. Disturbance to prehistoric sites by any particular operation would have to be assessed on a basis. In sum, locatable mineral mining will likely directly and adversely impact all manner of cultural and paleontological resources both inside and outside of the Steese NCA.

In addition, new access roads often need to be constructed in order to reach mineral claims. The construction of new roads not only has a direct and adverse effect on cultural and paleontological resources, but would also have an indirect effect by providing new access by other users to previously isolated lands. With more resource users accessing BLM-managed lands, there would be an increased potential of more people finding surface cultural resources and adversely impacting them, either intentionally or unintentionally.

Effects from Recreation

At present, a wide range of recreational opportunities are available and/or are authorized in the Steese Subunit including: an established National Recreation Trail, private and commercial floating opportunities on the Birch Creek WSR, and both motorized and non-motorized overland travel. The construction of infrastructure to support these activities can be ground disturbing, and thus could potentially directly affect cultural and paleontological resources. Also, visitors to the public lands have the potential to inadvertently find surficial cultural and paleontological resources, and thus would have the potential to adversely impact such resources, either intentionally or unintentionally.

Effects from Travel Management

Based upon current trends, the BLM assumes ever increasing travel visitation and use, both motorized and non-motorized, in the Steese Subunit. Since OHV use accounts for a sizeable portion of travel-related activities in the Steese NCA, it is anticipated that the demand for this activity will continue to grow in the future, necessitating construction of additional trails and mechanisms for managing these trails. Construction of new trails, like any other surface-disturbing activities, would have the potential to directly and adversely affect cultural and paleontological resources.

In addition, the construction of new trails would also have an indirect effect by providing new access to previously isolated lands. With more resource users accessing BLM-managed lands, there would be an increased potential of more people finding surface cultural resources and adversely impacting them, either intentionally or unintentionally.

4.5.1.1.2. Alternative B

Effects from Lands and Realty

Under Alternative B, only two of the transportation corridors would be retained in the Steese NCA. Since few rights-of-way are anticipated, and since rights-of-way can be approved outside of the corridors, the effects of Alternative B would be essentially the same as Alternative A.

Effects from Locatable Minerals

Alternative B has the same direct and indirect effects on cultural and paleontological resources as outlined in Alternative A, except the potential impacts to these resources would be increased as new areas would be opened to potential mining activities and more roads would potentially need to be built to access those areas. In Alternative B, about 1,230,000 acres would be closed and about 45,000 acres would be open to locatable mineral entry (Map 31). Closed areas include the BLM's Central Administrative Site, disposal lands, and the Steese SRMA, the latter of which includes the Steese NCA and the Birch Creek WSR.

See Alternative A for assumptions about the nature and type of placer mining operations that are likely to occur within the Steese Subunit. Further assumptions for locatable minerals for Alternative B in this subunit indicate one suction dredge operation in any given year, eight small-scale placer mines, and two large-scale mines. This equates to 306-404 acres of disturbed ground, in areas that very likely contain evidence of prior, historic mining operations, which have occurred in some drainages in the Steese Subunit for about 130 years. Disturbance to prehistoric sites by any particular operation would have to be assessed on a project-specific basis. In sum, locatable mineral mining will likely directly and adversely impact all manner of cultural and paleontological resources.

Effects from Recreation

A wide range of recreational opportunities would be available and/or are authorized under Alternative B, in which the Steese Subunit is divided into the Steese SRMA and those lands outside of the SRMA. The Steese SRMA (about 1,245,000 acres) includes the Steese NCA and the Birch Creek WSR. In Alternative B, the SRMA would be divided into seven RMZs (Map 45), each with a well defined "setting character," ranging from Primitive, to Semi-Primitive, to Backcountry. The recreation management objectives associated with each of these are well defined, with differing emphases on building and maintaining facilities, the establishment and maintenance of winter and summer trails, and the range of summer and winter OHV uses. Construction of facilities by the BLM to meet recreational demand can directly and adversely impact surface and subsurface cultural and paleontological resources. The BLM assumes a ten to fifteen percent increase over the life of the plan in demand for recreational users and visitation (both motorized and non-motorized), resource damage, and user-resource conflicts. Any increased visitation to the public lands has a concurrent potential increase for inadvertently finding surficial cultural and paleontological resources and adversely impacting such resources, either intentionally or unintentionally.

Effects from Travel Management

A separate Travel Management Plan (TMP) would be developed for the Steese Subunit after approval of the RMP. Until that time, interim management would apply under Alternative B. Under Alternative B, most of the Steese NCA would be closed to summer motorized use. In lands outside of the SRMA, summer OHV use would be limited to existing routes only. Summer OHV use on existing trails and snowmobile use both on and off trails in the winter would have little or no effect on cultural or paleontological resources. As a result, there would be no direct adverse effect to these resources by this alternative prior to the writing and implementation of a separate TMP.

However, the current visitation rate of increase for the Steese Subunit is approximately ten percent per year, which is expected to be maintained for the foreseeable future. Although a large portion of this is assumed to be by OHV users, there would still be increased use by non-motorized users in the subunit, both on and off established trails. With more resource users accessing BLM-managed

lands, there would be an increased potential of more people finding surface cultural resources and potentially adversely impacting them, either intentionally or unintentionally.

4.5.1.1.3. Alternative C

Effects from Lands and Realty

Same as Alternative B.

Effects from Locatable Minerals

Alternative C has the same direct and indirect effects on cultural and paleontological resources as outlined in Alternatives A and B, except the potential impacts to these resources would be increased as new areas would be opened to potential mining activities and more roads would potentially need to be built to access those areas. In Alternative C, 992,000 acres would be closed and about 285,000 acres of previously withdrawn lands would be open to locatable mineral entry. The closed areas would include the Steese ACEC, the RNAs, disposal lands, the Birch Creek WSR Corridor, and portions of the Steese NCA (Map 33). Alternative C has more acres opened to potential mineral activity than Alternative B, and thus would have a greater potential adverse impact to cultural and paleontological resources. Most of the new mining claims would be located within the Steese NCA, as these are the areas with higher mineral potential.

See Alternative A for assumptions about the nature and type of placer mining operations that are likely to occur within the Steese Subunit. Further assumptions for locatable minerals for Alternative C in this subunit indicates nine suction dredge operations in any given year, 15 small-scale placer mines, and four large-scale placer mines. This equates to roughly 600-900 acres of disturbed ground, in areas that very likely contain evidence of prior, historic mining operations, which have occurred in some drainages in the Steese Subunit for about 130 years. Disturbance to prehistoric sites by any particular operation would have to be assessed on a project-specific basis. In sum, locatable mineral mining will likely directly and adversely impact all manner of cultural and paleontological resources.

Effects from Recreation

As in Alternative B, a wide range of recreational opportunities would be available and/or are authorized under Alternative C. The Steese SRMA and lands outside the SRMA would be identified for the same areas. In Alternative C the SRMA would be divided into 10 RMZs (Map 46), each with a well defined “setting character,” ranging from Primitive, Semi-Primitive, Backcountry, Middlecountry, and Frontcountry. Relative to Alternative B, Alternative C has added Frontcountry and Middlecountry settings. The recreation management objectives associated with each of these settings are well defined, with differing emphases on building and maintaining facilities, establishing and maintaining trails, and the range of summer and winter OHV uses.

Alternative C has the same assumptions for increased recreational use over the life of the plan as Alternative B, and has the same potential types of direct and indirect impacts to cultural and paleontological resources. The potential for effects would be slightly higher under Alternative C than Alternative B because there would be a greater emphasis on developing facilities to encourage and enhance recreational opportunities. This could potentially result in more visitors and increased access to areas that are currently difficult to access.

Effects from Travel Management

Similar to Alternative B, a separate Travel Management Plan (TMP) would be developed for the Steese Subunit after approval of the RMP. Until that time, interim management would apply under Alternative C. Although OHV limitations would be somewhat less restrictive under this alternative, e.g., fewer acres closed to summer OHV use and more acres where summer OHV use is limited to existing trails, the effects on cultural or paleontological resources would essentially be the same as Alternative B. Indirect effects related to increased visitation may be slightly higher than under Alternative B, as more of the existing trails would be available for use, increasing summer access into the Steese NCA.

4.5.1.1.4. Alternative D

Effects from Lands and Realty

Alternative D would be the same as Alternative B, except that there would be no designated transportation corridors. The lack of corridors would have a minimal effect on cultural and paleontologic resources because few rights-of-way would be authorized.

Effects from Locatable Minerals

Alternative D would have the same direct and indirect effects on cultural and paleontological resources as outlined in Alternative A, except the potential impacts to these resources would be increased as new areas would be opened to potential mining activities and more roads would potentially need to be built to access those areas. Approximately 585,000 acres would be closed and about 690,000 acres of previously withdrawn lands would be open to locatable mineral entry, most of this in the Steese NCA. The closed areas would include the Steese ACEC, the RNAs, disposal lands, the Birch Creek WSR Corridor, and portions of the Steese NCA (Map 35). Alternative D has more acres opened to potential mineral activity than Alternatives B and C, and thus would have a greater potential adverse impact to cultural and paleontological resources. As in Alternative C, most of the new mining claims would be located in the Steese NCA.

See Alternative A for assumptions about the nature and type of placer mining operations that are likely to occur within the Steese subunit. Further assumptions for locatable minerals for Alternative D indicates 12 suction dredge operations in any given year, 24 small-scale placer mines, and four large-scale placer mines. This equates to 768-1088 acres of disturbed ground, in areas that very likely contain evidence of prior, historic mining operations, which have occurred in some drainages in the Steese Subunit for about 130 years. Disturbance to prehistoric sites by any particular operation would have to be assessed on a project-specific basis. In sum, locatable mineral mining will likely directly and adversely impact all manner of cultural and paleontological resources.

Effects from Recreation

A wide range of recreational opportunities would be available and/or are authorized under Alternative D. Same as Alternatives B and C, the Steese Subunit is divided into the SRMA and those lands outside of the SRMA. In Alternative D the SRMA would be divided into nine RMZ (Map 47). Alternative D, however, has more acres in Frontcountry and Middlecountry than does Alternative C. The recreation management objectives associated with each of these settings would be the same as those defined in Alternatives B and C.

Alternative C has the same assumptions for increased use over the life of the plan as Alternative B, and has the same potential types of direct and indirect impacts to cultural and paleontological

resources. The potential for effects would be slightly higher under Alternative D than Alternatives B or C because there would be a greater emphasis on developing facilities to encourage and enhance recreational opportunities. This could potentially result in more visitors and increased access to areas that are currently difficult to access.

Effects from Travel Management

Similar to Alternatives B and C, a separate Travel Management Plan (TMP) would be developed for the Steese Subunit after approval of the RMP. Until that time, interim management would apply under Alternative D. OHV limitations would be somewhat less restrictive under this alternative, e.g., fewer acres where summer OHV use would be prohibited. The effects on cultural or paleontological resources would essentially be the same as Alternative A. Indirect effects related to increased visitation may be slightly higher than under Alternatives B and C, as summer motorized access into the Steese NCA would be increased.

4.5.1.2. Fish and Aquatic Species Steese Subunit

Summary of Effects

Fish and aquatic resources would be primarily affected by surface-disturbing activities (such as placer mining or trail construction) which alter stream channels, remove or damage riparian vegetation, or result in soil erosion and sedimentation to fish and aquatic habitat. The level of impact would depend on the success and adequacy of protective measures. Alternative A would provide the greatest protection to fish and aquatic resources within the planning area because the entire subunit is currently closed to new locatable mineral entry. Alternatives B, C, and D open increasingly more acres and stream miles for locatable mineral entry, respectively. Alternative D would have the greatest potential to impact fish and aquatic resources.

Table 4.11. Stream Miles and Acres Open to Locatable Mineral Entry by Alternative, Steese Subunit

STEESE SUBUNIT (BLM-managed lands)	ALTERNATIVES			
	A	B	C	D
Stream miles	1,794	1,794	1,794	1,794
Stream miles open to locatables (proposed)	0	59	386	882
Stream miles open to locatables (proposed) plus miles within current valid federal claims	106	165	492	988
Stream miles within RCAs in areas open to locatables (proposed)	0	23 (14%)	23 (5%)	59 (6%)
Stream miles outside RCAs in areas open to locatables (proposed)	106 (100%)	142 (86%)	469 (95%)	929 (94%)
Acres open to locatables (proposed)	0	44,000	285,000	705,000
Acres open to locatables (proposed) plus miles within current valid federal claims	7,000	51,000	292,000	712,000
Anticipated stream gravel disturbance by suction dredging during life of plan measured in cubic yards	40,000	40,000	360,000	480,000
Potential impacts to fish and aquatic habitat (1-4, 4 = greatest)	1	2	3	4

4.5.1.2.1. Alternative A (No Action)

Effects from Leasable Minerals

No lands within the Steese Subunit are open to leasing of either fluid minerals (oil and gas) or solid leasables (coal). There are no existing mineral leases. Under this alternative, no impacts to fisheries and aquatic resources resulting from leasable minerals would occur.

Effects from Locatable Minerals

Of the following effects, seventy-one percent would occur within the Steese NCA. No additional lands within the Steese subunit would be open to new locatable mineral entry. Locatable mineral development would be limited to valid existing claims. Currently, there are 7,200 acres and 106 miles of stream on active federal mining claims in the Steese Subunit that have been mined or have the potential to be mined. Of these 7,200 acres and 106 miles of stream, seventy-one percent occur within the Steese NCA. The Birch Creek WSR (within one-half mile of the banks) is withdrawn from locatable minerals in all alternatives (ANILCA 606(a)). The anticipated number of acres directly disturbed by small- and large-scale placer mines under Alternative A is estimated at up to 370 acres, or approximately six miles of stream over the life of the plan.

The indirect impacts would likely extend upstream and downstream of the mine operation. The extent of these impacts are difficult to quantify, but could more than double the miles of stream directly affected by the placer operation. Under Alternative A, roughly 10 suction dredge operations are anticipated over the life of the plan. Each operation is anticipated to last two years. The amount of stream gravel disturbed from one suction dredging operation is estimated to be 1,800 cubic yards per year. Over the life of the plan 36,000 cubic yards of stream gravel could be disturbed. The context and intensity of impacts would depend on the timing, location, and proximity of the operation to other operations. Given the dispersed nature of suction dredging operations coupled with the limited number of existing federal claims, impacts are expected to be localized and may be short- or long-term.

Under Alternative A, protection of fisheries and aquatic resources would rely on the existing regulations and mitigation measures developed during project-specific NEPA analysis. Mining operations within the Steese NCA require a Plan of Operation, which would allow for the integration of reclamation measures specifically designed to rehabilitate fisheries habitats. Fish species impacted from locatable mineral activity in this subunit include both resident and anadromous species. Impacts to fish and aquatic resources in this alternative would be considered low to moderate, but could have long-term effects resulting in an overall decrease in levels of fish populations at the local level. Compared to the other alternatives, Alternative A would likely provide the greatest protection to fisheries and aquatic resources, because it would result in the least amount of potential disturbance. However, under this alternative, fish and aquatic resources may not benefit from the more rigorous reclamation standards and ROPs proposed in the action alternatives which are designed to minimize impacts and reduce recovery time. As such, Alternative A may result in longer duration impacts as compared to the action alternatives.

Effects from Recreation

Impacts would be similar to those discussed as common to all subunits section 4.3.1.4.1. There are no SRMAs that would set recreation objectives or develop visitor use limits. Unmanaged trail proliferation would continue with no guidance for proper construction and placement for new trails. Alternative A would provide the least protection to fish and aquatic habitats from recreation activities. However, impacts to fish and aquatic habitat are expected to be minimal.

Effects from Travel Management

Current OHV designations in the Steese Subunit are Limited, allowing summer cross-country travel of OHVs weighing 1,500 GVWR and less except in RNAs, the Birch Creek WSR Corridor, and the Primitive Management Unit. Unmanaged trail proliferation would continue with no guidance for proper construction and placement of new trails. Given the assumption of increased OHV use during the life of the plan, the unauthorized and unmanaged proliferation of trails is also likely to increase with a resulting increase in erosion and sediment impacts. Since the majority of the subunit is open to off-road travel by OHVs weighing 1,500 GVWR or less, and assuming increased OHV use during the life of this plan, this alternative could have localized impacts on fish and aquatic habitats. Alternative A has more potential to effect fish and aquatic habitat than Alternatives B, C, and D.

Effects from Special Designations

The following special designations and effects would occur within the Steese NCA. The Birch Creek WSR contains high-value fishery resources, supporting three species of salmon and numerous resident fish species. The river corridor is closed to mineral leasing and location and would remain closed in all alternatives. Given the adverse short- and long-term impacts to fisheries and aquatic resources associated within mining, areas closed to mineral entry would generally maintain aquatic habitats and fish and aquatic populations.

Fish and aquatic resources are not of particularly high value within the Mount Prindle (2,800 acres) and Big Windy Hot Springs RNAs (160 acres), however increased resource protection in these areas could be beneficial to fish and aquatic resources. These RNAs would be retained in all alternatives.

4.5.1.2.2. Alternative B

Effects from Leasable Minerals

Effects from mineral leasing would occur mostly outside of the Steese NCA. Approximately 45,000 acres would be open to oil and gas leasing, but leasing would not occur without further NEPA analysis. Interest from industry is expected to be limited due to the lack of high potential oil and gas areas on BLM lands. Seismic exploration would be allowed during winter months after the tundra is frozen. If seismic exploration does occur, it would likely occur in high potential areas, but is unlikely during the life of the plan. Given those assumptions, impacts to fisheries and aquatic habitat would be minimal to non-existent.

Potential threats to overwintering fish from seismic surveys would primarily stem from: 1) stress associated with acoustic energy pulses transmitted into the ground directly over overwintering pools, and 2) physical damage to overwintering habitat caused by seismic vehicles. Large overwintering pools might allow fish to flee the immediate area of intense stress where fish occupying small pools might not have that option. Depending on proximity, adult fish could suffer no more than temporary discomfort, where intense acoustical pulses could be lethal to juveniles. Given that overwintering habitat represents a small percentage of the subunit, it is unlikely that seismic transmissions would occur directly over overwintering sites with any degree of regularity. Furthermore, seismic crews could avoid known overwintering areas. Overall, any effects to overwintering fish caused by winter seismic surveys would be localized and would likely to have little effect on fish populations within the planning area.

Effects from Locatable Minerals

The level of effects within the Steese NCA would be similar to Alternative A. The Steese Subunit contains 1,275,000 acres of BLM lands and 44,000 of those acres (outside of the Steese NCA) would be open to locatable mineral entry in Alternative B (Map 31). Including valid existing federal mining claims, approximately 165 miles of stream would be open to locatables, with 23 (fourteen percent) of those miles occurring in RCAs which require more rigorous standards for reclamation. Under Alternative B, protection of fish and aquatic habitat in eighty-six percent of the streams open to locatables would rely on the current regulations, reclamation requirements and ROPs outlined in this plan, and mitigation measures developed during project-specific NEPA analysis. Of the stream miles open to locatables, one mile occurs within a high mineral potential area. The anticipated number of acres directly disturbed by small- and large-scale placer mines under Alternative B is estimated at up to 500 acres, or approximately seven miles of stream over the life of the plan.

The indirect impacts of mining would likely extend upstream and downstream of the mine operation. Indirect impacts to upstream habitats would include channel gradient adjustments (downcutting), while downstream impacts would include sedimentation and pool filling. The extent of these impacts are difficult to quantify, but could more than double the miles of stream directly affected by the placer operation. The anticipated number of suction dredging operations is 10 (same as Alternative A) and the impacts from suction dredging would be the same as described in Alternative A.

Impacts to fish and aquatic resources under this alternative would likely be low because only nine percent of the stream miles within the subunit are open to locatables and only one mile falls within a high mineral potential area. Based on the amount of land opened to mineral entry, this alternative would potentially provide more protection to fish and aquatic habitat than Alternatives C and D but less than A.

Effects from Recreation

Impacts would be similar to those discussed as common to all subunits in section 4.3.1.4.1. Under Alternatives B, C, and D, the Steese SRMA would contain RMZs, each of which would be managed by for specific activities, experiences, and benefits in a corresponding prescribed recreation setting (Primitive, Semi-Primitive, Backcountry, Middlecountry, or Frontcountry). Primitive Zones would have the lowest potential impacts to fish and aquatic habitat, where Frontcountry zones would have the highest.

In Alternative B, the Steese SRMA (1,245,000 acres) would include the Steese NCA and the Birch Creek WSR Corridor and be divided into seven RMZs, which would be managed for Primitive, Semi-Primitive, or Backcountry setting. This alternative has by far the largest area managed for a Primitive setting and would provide more protection to fish and aquatic habitat than Alternatives A, D, and, C (in that order). Impacts to fish and aquatic habitat are expected to be minimal under this alternative.

Effects from Travel Management

Under Alternative B, the entire subunit is closed to OHVs during summer months (May 1 through October 15) without a permit or approved Plan of Operations. Fish and aquatic resources generally benefit when areas are closed to OHVs, because closure reduces potential impacts associated with route development and erosion. Impacts to fish and aquatic habitat under Alternative B would be minimal or non-existent.

Effects from Special Designations

The following special designations and effects would occur within the Steese NCA. In addition to the impacts from RNAs and the Birch Creek WSR described under this subsection for Alternative A, 927,000 acres would be designated as the Steese ACEC (Map 65) to protect habitat for the Fortymile caribou herd and Dall sheep. The ACEC would remain closed to locatable and leasable mineral entry, subject to valid existing rights. Fish and aquatic habitats benefit in areas closed to mineral entry, because the habitat generally remains intact. A mining Plan of Operations would be required on any mining activity within the ACEC (43 CFR 3809.11(c)(3)). Birch Creek contains high-value fishery resources, supporting three species of salmon and numerous resident fish species. This ACEC includes a large portion of the Birch Creek watershed and would provide additional protection to fish and aquatic habitat outside of the Birch Creek WSR Corridor. Impacts to fish and aquatic habitat would be the most beneficial under this alternative.

Big Windy Creek would be recommended as suitable for designation in the National Wild and Scenic Rivers System. Fish and aquatic habitat resources are not of particularly high value in Big Windy Creek, however the river corridor would be closed to mineral leasing and location. Given the adverse short- and long-term impacts to fisheries and aquatic resources associated within mining, mineral entry closure on Big Windy Creek would promote maintenance of aquatic habitats and fish and aquatic populations.

4.5.1.2.3. Alternative C

Effects from Leasable Minerals

Effects from mineral leasing under this alternative occur mostly outside of the Steese NCA. The effects are the same as Alternative B, except 285,000 acres would be open to oil and gas leasing. Potential impacts under Alternative C would be greater than Alternative B, because more acres would be open to disturbance.

Effects from Locatable Minerals

The following effects would occur primarily within the Steese NCA. Approximately 285,000 acres would be open to locatable minerals in Alternative C. Including valid existing federal mining claims, approximately 492 miles of stream would be open to locatable minerals with 23 (five percent) of those miles occurring in RCAs. Those 23 stream miles would be subjected to more rigorous reclamation standards. Protection of fish and aquatic habitat in 469 (ninety-five percent) miles of stream open to locatables would rely on the current regulations, reclamation requirements and ROPs outlined in this plan, and mitigation measures developed during project-specific NEPA analysis.

The likelihood of impacts would be greatest in areas of medium to high mineral potential, which equates to roughly 250 of the 492 river miles that are open to locatable minerals under Alternative C (BLM 2009c). The anticipated number of acres directly disturbed by small- and large-scale placer mines under Alternative C is estimated at up to 770 acres, or 11 miles of stream over the life of the plan. The anticipated number of suction dredging operations during the life of this plan is 90, a substantial increase compared to Alternatives A and B. These operations could potentially result in disturbance of 360,000 cubic yards of stream gravel over the life of the plan. Impacts from suction dredging are discussed in section 4.3.1.4 Impacts Common to All Subunits.

Based on the number of stream miles (250) that would be open to locatable minerals in moderate to high mineral potential areas and the absence of higher reclamation standards on the majority of these streams (ninety-five percent), adverse impacts to fish and aquatic resources under this alternative may be readily detectable and long-term (10–20 years) within these areas. This could result in a downward trend of fish populations at the watershed scale over the life of this plan. Alternative C would provide less protection to fish and aquatic habitat than Alternatives A and B, but more protection than Alternative D.

Effects from Recreation

Impacts would be similar to those discussed as common to all subunits in section 4.3.1.4.1. The Steese SRMA would include the same lands as in Alternative B but would be divided into 10 RMZs. Recreation settings would range from Primitive (3,000 acres) to Frontcountry. This alternative allows for increased development of visitor facilities, landscape modifications, and group size as compared to Alternative B, and has greater potential to adversely effect fish and aquatic resources due to increased disturbance. Alternative C would provide more protection to fish and aquatic habitat than Alternatives A and D, but less than Alternative B based on the amount of potential disturbance. Impacts to fish and aquatic habitat are expected to be minor under this alternative.

Effects from Travel Management

Under Alternative C, forty-seven percent of the subunit would be open to summer use (May 1 through October 15) of OHVs weighing 1,000 pounds curb weight and less on existing routes and for the retrieval of game. Impacts to fish and aquatic resources would be highly localized and associated with route erosion and stream crossings. Impacts are expected to be minor and generally short-term under this alternative. Alternative C would provide less protection to fish and aquatic habitat than Alternative B, but more than Alternatives D and A.

Effects from Special Designations

In addition to the impacts from RNAs and the Birch Creek WSR described under this subsection for Alternative A, 460,000 acres would be designated as the Steese ACEC (Map 66). Alternative C provides less protection to fish and aquatic resources than does Alternative B, because the ACEC is smaller and Big Windy Creek would not be recommended for designation as a WSR under Alternative C allowing for an increase of potential disturbance.

4.5.1.2.4. Alternative D

Effects from Leasable Minerals

The effects from mineral leasing under this alternative occur mostly outside of the Steese NCA. The effects are the same as Alternative B, except 693,000 acres would be open to oil and gas leasing. Potential impacts under Alternative D would be the greatest because it allows for the greatest amount of disturbance.

Effects from Locatable Minerals

The following effects would occur primarily within the Steese NCA. Alternative D results in the largest area being opened to locatable mineral entry compared to the other alternatives, with 705,000 acres being available. Including valid existing federal mining claims, this corresponds

to approximately 988 miles of stream that would be open to locatables, with only six percent of those miles occurring in RCAs which require higher standards for reclamation. Compared to Alternative C, this alternative allows locatable mineral entry on 460 additional miles of stream which have less stringent requirements than those in RCAs. If mined, desired future conditions for aquatic habitats and stream function may not be achieved for 10 to 20 years on 460 additional miles of stream when compared to Alternative C, 787 miles compared to Alternative B, and 823 miles compared to Alternative A..

Under Alternative D, protection of fish and aquatic habitat on 929 miles (ninety-four percent) of the streams open to locatables would rely on the current regulations, reclamation requirements and ROPs outlined in this plan, and mitigation measures developed during project-specific NEPA analysis. Of the stream miles open to locatables, 413 stream miles fall within areas having medium to high mineral potential. The anticipated number of acres directly disturbed by small- and large-scale placer mines under Alternative D is estimated at 1,040 acres, or approximately 15 miles of stream over the life of the plan.

Alternative D would allow 45 miles of anadromous stream in the Preacher Creek basin to be directly impacted by locatable mineral entry, where in Alternatives B and C Preacher Creek is designated as an RCA and is closed to locatables. The Preacher Creek basin contains medium mineral potential and has reasonable access, as such, it is probable that widespread development would occur within this basin beginning in the headwater areas and progressing downstream. The localized loss of riparian and streambank vegetation and creation of areas with channel instability could be widespread creating a matrix of degraded habitats interspersed with “islands” of intact riparian areas. These islands would likely exhibit degraded pool and spawning habitat quality resulting from catchment erosion and downstream sedimentation. In an unpublished report from 1985, a BLM fish biologist stated that the degradation of other portions of the Birch Creek drainage from placer mining activity may increase the importance of Preacher Creek for the production of Arctic grayling within the Birch Creek system. More recently in 2005, BLM resource specialists observed adult Chinook salmon in Preacher Creek within the area open to locatables under this alternative (verbal communication). The resulting impacts to the fish and aquatic community could be significant and long-term (10 to 20 years), adversely affecting Chinook and grayling populations.

Approximately 120 suction dredging operations are anticipated during the life of this plan, potentially resulting in disturbance of up to 480,000 cubic yards of stream gravel over the life of this plan. Impacts from suction dredging are discussed in the section 4.3.1.4 Impacts Common to All Subunits, Fish and Aquatic Species.

This alternative has the potential to significantly impact both Chinook salmon spawning habitat and high quality resident fish habitat in the Preacher Creek drainage. This alternative has the greatest potential impact to fish and aquatic habitat.

Effects from Recreation

Impacts would be similar in type to those discussed as common to all subunits in section 4.3.1.4.1. The Steese SRMA would include the same lands as in Alternatives B and C but would be divided into nine RMZs. Recreation settings would range from Primitive (3,000 acres) to Frontcountry. Much less area would be managed for a Semi-Primitive setting. This alternative allows for the greatest development of visitor facilities, landscape modifications, and group size. However, impacts to fish and aquatic habitat should be minor and easily mitigated. Alternative D would

provide more protection to fish and aquatic habitat than Alternative A, but less than Alternatives B and C.

Effects from Travel Management

Under Alternative C, sixty percent of the subunit would be open to summer cross-country use of OHVs weighing 1,000 pounds curb weight or less. Unmanaged trail proliferation may occur with no guidance for proper construction and placement of new trails. Given the assumption of increased OHV use during the life of the plan, the unauthorized and unmanaged proliferation of trails is also likely to increase with a resulting increase in erosion and sediment impacts. Impacts to fish and aquatic resources would be highly localized and associated with route erosion and disturbance to riparian vegetation. Impacts are expected to be minor and generally short-term under this alternative. Alternative D would provide more protection to fish and aquatic habitats than Alternative A, but less than Alternatives B and C.

Effects from Special Designations

In addition to the impacts from RNAs and the Birch Creek WSR described under this subsection for Alternative A, 193,000 acres would be designated as the Steese ACEC (Map 67). Impacts in Alternative D are similar to Alternative C, however Alternative D provides less protection to fish and aquatic habitats than Alternative C, because the ACEC is smaller and includes less fish habitat.

4.5.1.3. Invasive Species Steese Subunit

Summary of Effects

Primary uses in the Steese Subunit that will impact non-native invasive species (NIS) management are mineral development, recreation, and travel management. Outreach and education would be used to prevent the introduction and spread of NIS. Early Detection and Rapid Response (EDRR) and inventory and monitoring would further halt the introduction and spread of NIS.

Non-native invasive plants (NIP) are the focus of NIS management in this analysis. NIP can thrive in marginal habitats, such as compacted and dry soils and those contaminated by road treatments, such as seeding for bank stabilization. NIP can outcompete native vegetation and become established at disturbed sites and some, such as white sweetclover (*Melilotus officinalis* formerly *M. alba*) and orange hawkweed (*Hieracium aurantiacum*), can move into adjacent undisturbed sites (AKNHP, Gronquist 2008, Villano 2007).

4.5.1.3.1. Effects Common to All Alternatives

In addition to those effects listed as common to all subunits in section 4.3.1.5, the following effects would occur in the Steese Subunit.

Effects from Forest and Woodland Products

Management decisions for forest and woodland products vary widely over the four alternatives. Alternative A best protects against introduction and spread of NIP from impacts of forest and woodland management, as no commercial use is permitted. Alternative D, which allows commercial harvest everywhere except the Birch Creek WSR Corridor and the RNAs, would have the greatest potential impact. Timber within the subunit is not considered marketable due to the remote location of stands of suitable trees and few if any, proposals for commercial timber

harvest would be expected over the life of the plan. Impacts from commercial uses on NIP, animal and pathogen management would be expected to be negligible.

Timber salvage would be allowed throughout the subunit in Alternatives C and D. Demand for salvage sales has been lacking and would be expected to be very low, having negligible impacts on NIP management. Proposals for commercial or salvage sales would be analyzed at the project level and include stipulations to prevent introduction and spread of NIP.

Demand for personal use is normally from adjacent communities and has been low in the past. Demand is not expected to increase greatly over the life of the plan. Impacts on NIS management from personal use would be negligible.

Demand for commercial forest products can be fairly high, primarily for mushrooms after wildland fires. Otherwise, there has been little to no interest in commercial products in the past, and demand is not expected to increase significantly in the future. Impacts from commercial forest products would be evaluated at the proposal level and be mitigated through stipulations to the permits and through educating applicants on prevention practices.

Effects from Lands and Realty

Most lands and realty actions result in ground disturbance, which increases the potential for NIP to become established. Vehicles and equipment used for construction and maintenance in rights-of-way or site development can import NIS to the disturbed area. The potential for introduction and spread of NIS from these actions would be expected to be significant. Impacts would be mitigated to the extent possible through permit stipulations and education and outreach efforts directed at applicants.

Rights-of way are continuous and provide pathways for spread of NIP along the linear disturbances and along trails, rivers or streams that they cross. Many NIP seeds are readily dispersed by water. Infestations of species such as white sweetclover (*Melilotus officinalis*, formerly *M. alba*) have been documented as monocultures out competing native willows on sand bars along Interior Alaska rivers spreading from source populations originating far upstream along roads (Spellman 2008, Conn et al., 2008).

Effects from Solid Leasable Minerals

Although a portion of the subunit is open to solid leasable minerals in each alternative, no impacts are expected to occur to NIP management from exploration or development of coal fields or other solid leasable minerals in the Steese Subunit. A decision on coal leasing is deferred and there is no potential for any other solid leasable minerals in the subunit.

Effects from Recreation

Management of recreation areas through recreation opportunity spectrum (ROS) classes largely set the stage for the level of protection or development afforded an area. The size and location of RMZs, and therefore ROS settings, change with each alternative and are reflected in the decisions for travel management and related activities. Impacts to NIS are discussed in this section under these other resource uses.

Travel Management

Travel would be managed in the Steese Subunit under interim prescriptions until a Comprehensive Travel Management Plan is completed. Interim alternatives for travel management in the subunit include a range of limits on OHV gross vehicle weight restrictions, permit requirements, designated trails and cross-country summer use. Limitations on OHV use, particularly limiting use to designated trails, would help prevent the introduction of NIP and aid EDRR efforts by concentrating use and reducing disturbance to native vegetation. Permitting use would provide opportunities to educated users on the threats to habitats from NIP and prevention measures they can take (use and site-specific mitigation).

In all alternatives, non-motorized forms of transportation would be allowed and aircraft use would be allowed in all but Primitive RMZs. Motorized boat use would be allowed on portions of the Birch Creek WSR in some alternatives. These forms of transportation could contribute significantly to the introduction and spread of NIP, animal and pathogen pests. Boats and other watercraft are transported to public lands from locations around the continent. They harbor NIS that may become dislodged and establish on susceptible public lands. Small aircraft can spread NIS from urban airstrips to remote strips, gravel bars and benches. Outreach and education to these user groups will be the most effective method to reduce impacts caused by these uses.

In Primitive RMZs, all other OHV require a permit or approved Plan of Operations and no aircraft would be allowed. Travel management prescriptions for the undesignated recreation areas and all other RMZs besides Primitive would allow cross-country winter use of snowmobiles 1,500 curb weight and less. Summer use varies by alternative and RMZ. The size of the affected area varies based on boundaries of the RMZs. Impacts to NIS from travel management prescriptions are discussed further under the alternatives below.

4.5.1.3.2. Alternative A (No Action)

Effects from Lands and Realty

Under Alternative A, acquisition of state lands within the Steese NCA would simplify land status and benefit management of NIS. No adverse impacts to NIS would be expected from land exchanges.

Four transportation corridors are identified in the Steese NCA in Alternative A (Map 15). All rights-of-way would be located within these corridors as much as possible. The potential for introduction and spread of NIP could be reduced as a result. To date, only one development has been made in designated transportation corridors. No potential applications for rights-of-way have been identified in the reasonably foreseeable future. Should rights-of-way be requested, mitigation to prevent the introduction and spread of NIP from development and maintenance would be incorporated in permit stipulations.

Effects from Fluid Leasable Minerals

All BLM lands are withdrawn from fluid leasable minerals and there are no existing leases. No impacts would occur under Alternative A.

Effects from Locatable Minerals

Under Alternative A, mining activity is limited to valid existing claims (10,000 acres). Impacts to NIP would continue to occur at the current levels. Mining results in removal of vegetation and overburden and the potential for introduction and spread of NIP from these actions would be

expected to be significant. Mining operations are analyzed at the project level and stipulations include reclamation and other practices to reduce introduction and spread of NIP.

Suction dredge operations could occur in the Steese Subunit under Alternative A. The reasonably foreseeable development scenario for the subunit assumes that one operation might occur under this alternative. Assuming it would be a Notice level operation, there would be an opportunity to develop mitigation to protect degradation of stream banks and prevent introduction of NIP species to the area of the operation.

Effects from Salable Minerals

Disposal of salable minerals would be allowed on all the BLM lands in the Steese Subunit and authorized at the project level. Material sites, including gravel pits, are often infested with NIP and substantial seed banks are harbored in the materials. NIP are spread to new areas with the contaminated materials. Vehicles and equipment brought into the sites may also be contaminated with NIP seed. Gravel and other materials are generally mined from areas near the project and materials from these sites are likely to be used for road and highway maintenance along the Steese Highway and other gravel roads in the area. Material sites within the area would be inspected for NIP and seed and treated as possible before being transported to project sites. Impacts to NIP from material sales would be mitigated as practicable through permit stipulations, and outreach and education. Demand for mineral materials from BLM lands is not expected to vary by alternative because materials are available and more accessible on state land.

Effects from Travel Management

Under this alternative, most BLM-managed lands would be open to OHV use 1,500 pounds curb weight and under, without a permit. For vehicles greater than 1,500 pounds curb weight off valid rights-of-way, a permit would be allowed but only for access to inholdings or with an authorized Plan of Operations. The Primitive RMZs, which include the two RNAs, would be generally open to winter cross-country use by snowmobile, but closed to summer motorized access off valid rights-of way without a permit.

Where permits are required, stipulations would be applied to reduce introduction and spread of NIS. EDRR, outreach and education, and larger scale control efforts would be used to try to mitigate impacts from permitted and unpermitted activities.

4.5.1.3.3. Alternative B

Effects from Lands and Realty

Acquisition of state inholdings within the Steese NCA, consolidation of scattered parcels around Circle, and disposal or exchange of lands identified for disposal will simplify land status and benefit management of NIS. No adverse impacts are expected from these actions.

Two transportation corridors are identified in Alternative B. The Steese ACEC, Mount Prindle RNA, and Birch Creek WSR Corridor would be right-of-way avoidance areas, except within transportation corridors. Consolidating rights-of-way within fewer designated corridors would further help prevent introduction and spread of NIP by reducing the overall disturbance. Monitoring for NIP and EDRR efforts would also be aided by concentration of rights-of-way into the fewer corridors.

Effects from Fluid Leasable Minerals

Under Alternative B, eight percent of the BLM lands in the Steese Subunit would be open to fluid leasable minerals. No lease sales are anticipated. If an area were nominated for a lease sale, the effects would be analyzed as a new NEPA document. Seismic exploration could occur on high potential oil and gas lands near Circle (Map 96). The level of exploration would not vary by alternative. Geophysical exploration would require removal of trees in 14-foot wide straight line transects over an area of 10 to 20 miles. The removal of canopy cover from the area could create favorable conditions for NIP to become established. Exploration would be conducted during winter when designated snow cover and frost depth would protect vegetation and soils from disturbance. Impacts to NIS under these conditions would be minimal and to the extent possible, further mitigated through the authorization process.

Effects from Locatable Minerals

Under Alternative B, eight percent of BLM lands would be open to new locatable mineral entry. Although some low mineral potential lands would be opened to mineral entry, impacts from both new claims and valid existing claims would be expected to be the same as Alternative A. Mining operations would be analyzed and stipulations would include reclamation and other best management practices to reduce introduction and spread of NIP. Monitoring and EDRR efforts by the BLM would further reduce the potential for NIP to become established.

Suction dredging operations are expected to be at the same level and impacts as described for Alternative A.

Effects from Salable Minerals

Under Alternative B, nine percent of BLM lands would be available for material site sales and exposed to potential infestations. Operations would be analyzed on a project basis and stipulations would include reclamation and other best management practices to reduce the potential for introduction and spread of NIP. Little additional demand for salable minerals is expected because materials are more accessible on state land. Potential for impacts to NIS would be the lowest under this alternative.

Effects from Travel Management

Under Alternative B the size of the Primitive RMZ (1,033,000 acres) would be substantially larger than areas with similar management in Alternative A (3,000 acres). Primitive RMZs would be closed to the use of all motorized OHV and to aircraft. Travel management prescriptions in the undesignated recreation areas and Semi-Primitive and Backcountry RMZs would be limited to cross-country winter use of snowmobiles, 1,500 pounds curb weight and less. Use of any other OHV would require a permit or approved Plan of Operations. Using designated trails reduces disturbance from pioneering of trails, which protects against pathways for new infestations. EDRR would be enhanced by concentration of OHV on trails. Where permits would be required, stipulations to reduce the threat of introductions would mitigate potential. Other active management, including outreach and education at potential entry points could be used to mitigate impacts.

4.5.1.3.4. Alternative C

Effects from Lands and Realty

Effects from land tenure changes and transportation corridors would be the same as Alternative B.

Alternative C differs from Alternative B in that no right-of-way avoidance areas would be designated. Impacts to NIS, particularly plants, would increase and could be significant if multiple rights-of-way were developed, increasing the area of disturbance and the potential for NIP to establish and spread along the routes. Realty actions, such as rights-of-way, would be considered at the project level and include stipulations to manage impacts to NIP.

Effects from Fluid Leasable Minerals

Under Alternative C, twenty percent of BLM lands within the Steese NCA would be open to fluid leasable minerals, as described in Table 2.14. About 42,000 acres of BLM-managed lands outside the NCA would also be open. Although a larger area would be open in Alternative C than in Alternative B, impacts from seismic exploration would be the same.

Effects from Locatable Minerals

Twenty percent of BLM-managed lands within the Steese NCA and about 42,000 acres outside the NCA would be open to locatable minerals under Alternative C. The mineral potential is high for most of the open areas. Demand for locatable minerals is expected to be high. NIP are well suited to pioneering on disturbances created by mining, which result in removal of all vegetation and overburden. Also, equipment brought to sites from outside the area could transport NIP seed. Impacts from mining on NIP management would be significant. Mining operations would be analyzed on project-specific basis and stipulations would include reclamation and other best management practices to reduce introduction and spread of NIS. Monitoring and EDRR efforts would further reduce the potential for NIP to become established.

The RFD scenario predicts that nine suction dredge operations could occur in the subunit over the life of the plan. Disturbance to the stream banks, particularly those from long-term camps associated with a suction dredge operation, would impact about 1.8 acres and result in disturbed areas, which provides an opportunity for NIP to become established. Operations would be analyzed at the Notice level and should allow for developing stipulations to prevent introduction of NIP.

Effects from Salable Minerals

Under Alternative C, ninety-five percent of BLM lands would be available for material site sales and exposed for potential infestations. Stipulations on mining operations would include reclamation and other best management practices to reduce the potential for introduction and spread of NIS. Little additional demand for salable minerals is expected because materials are more accessible on state land. Effects would be similar to Alternative A.

Effects from Travel Management

Alternative C differs from Alternative B in the location and size of the RMZs and that off-route travel for game retrieval is allowed in the undesignated recreation area and all but Semi-Primitive and Backcountry RMZs. Cross-country winter use of snowmobiles to 1,500 curb weight and less would be allowed on ninety-nine percent of the area. Primitive RMZs (3,000 acres) are closed to motorized use. Summer use of OHV 1,500 curb weight and less would be limited to existing trails in the undesignated recreation area and Middlecountry and Frontcountry RMZs, except for retrieval of game, which is allowed off trail. OHV 10,000 pounds and less curb weight would be allowed on existing roads only. A permit or approved Plan of Operations would be required for all other use.

The potential for introduction and spread of NIP would increase substantially in this alternative compared to Alternative B. Off-route travel for game retrieval would be concentrated during seasons when many of the weeds of concern will be in seed. Many of the OHV will come from outside the area, increasing the likelihood of introducing species that do not occur in the area. EDRR, outreach and education, and larger scale control efforts would be used to try to mitigate impacts.

4.5.1.3.5. Alternative D

Effects from Lands and Realty

Effects from changes to land tenure are the same as Alternative B.

Alternative D differs from other alternatives in that there are no designated transportation corridors or right-of-way avoidance areas. Impacts would be greatest under this alternative. Management and ecological costs of NIP would be high, as more area would be available for potential right-of-way development. Development would result in areas striped of native vegetation, creating favorable sites for NIP to become established. Rights-of-way would also create linear pathways from developed areas, potentially infested with NIP, through relatively intact portions of the Steese NCA. Impacts of construction and maintenance could be minimized through permit stipulations. Monitoring and EDRR efforts would require more resources and time than the other alternatives.

Effects from Fluid Leasable Minerals

Under Alternative D, fifty-four percent of BLM lands would be open to all leasable minerals. Although a larger area would be open, impacts from seismic exploration would be the same as Alternative B.

Effects from Locatable Minerals

Approximately fifty-four percent of the BLM lands in the subunit would be open to locatable minerals under Alternative D. The mineral potential is medium to high for most of the open areas (Maps 35 and 105). Demand for locatable minerals is expected to be high. Impacts to NIP under Alternative D would be the same as Alternative C, but the effects would be greatest under this alternative.

The RFD scenario predicts that 12 suction dredge operations could occur in the subunit over the life of the plan. Disturbance to the stream banks, particularly those from long-term camps associated with a suction dredge operation, would impact about 2.4 acres and result in disturbed areas, which can provide a seedbed for NIP to become established. Operations would be analyzed at the Notice level and should allow for developing stipulations to prevent introduction of NIP.

Effects from Salable Minerals

Impacts on NIS would be the same as Alternative A.

Effects from Travel Management

This alternative differs from Alternatives B and C in the location and size of the RMZs and that cross-country summer use of OHV 1,500 curb weight and under would be allowed in the undesignated recreation areas and Middlecountry and Frontcountry RMZs (485,000 acres).

Alternative D would have high potential for the introduction and spread of NIP from travel management prescriptions. Cross-country summer travel would occur across the seed maturation period of all weeds of concern. Many of the OHV will come from outside the area, increasing the likelihood of introduction of species that do not already occur in the subunit. EDRR, outreach and education, and larger scale control efforts would be used to try to mitigate impacts

4.5.1.3.6. Cumulative Effects

Cumulative impacts would be similar among the alternatives, but vary in extent of effect. In general, Alternative B would contribute least to cumulative effects, because management prescriptions are more conservative. Alternative D would contribute the most to cumulative effects. Alternative C would provide a balance of management of NIS while providing for multiple uses of BLM-managed lands. Alternative A would be similar to Alternative D, except that transportation corridors are identified and the area is closed to locatable and leasable minerals.

Demand for recreational use is anticipated to increase over the life of the plan as populations in the state increase and as technological advancements in recreation equipment occur. Placer mining is occurring on both valid federal mining claims and state mining claims in the Steese Subunit. Levels of placer mining would increase on BLM managed lands as additional lands are opened to mineral entry through Alternatives B, C, and D of this plan. Mining on state and private lands is anticipated to increase, largely dependent on prices of gold.

4.5.1.4. Soil and Water Resources Steese Subunit

Summary of Effects

As much of the Steese subunit is underlain by permafrost, even relatively minor surface disturbances can lead to long-term adverse impacts to soil and water resources. A variety of resources, resource uses, or programs outlined in the action alternatives protect soil and water resources; including proposed RCAs to protect fish and aquatic species habitat, ACECs, WSRs, RMZs, the SRMA, and restrictions on OHV travel. Varying adverse impacts to soil and water resources would likely result from surface disturbance associated with lands and realty, minerals development, recreation development, and increased OHV travel.

In general, the potential for direct adverse impacts increases sequentially from Alternative B to Alternative C to Alternative D. The impacts associated with Alternative A vary by program, but would generally be similar to Alternative C. Appropriate stipulations and ROPs for soil and water resources would be implemented to ensure that long-term impacts would be minimized or avoided under all alternatives.

In addition to the effects described as common to all subunits in section 4.3.1.6 Soil and Water Resources, the following effects would occur in the Steese Subunit.

4.5.1.4.1. Alternative A (No Action)

Effects of Land and Realty Actions

Four transportation corridors are established in the Steese NCA, two of which cross the Birch Creek WSR. These four corridors provide access to existing and potential mining areas. The construction of new trails or roads within these corridors would adversely impact soil and water

resources through increased erosion and siltation of streams. Impacts to soil and water resources would be reduced through site-specific analysis of subsequent authorizations.

Effects of Locatable Minerals

Under Alternative A, the Steese Subunit (1,276,000 acres) is withdrawn from locatable mineral entry. However, valid federal claims exist on 7,000 acres, with mining occurring on some of these claims. Anticipated locatable minerals activity includes one suction dredge operation, seven small-scale placer mines, and two large-scale placer mines. An estimated 300 to 400 acres of ground would be disturbed, with much of the disturbed areas having been previously worked by recent or historic mining operations (since placer mining has occurred throughout much of the Steese since the late 1800s).

Disturbance to soil resources and potential impacts to water quality from a particular mining operation would be reduced through site-specific analysis of subsequent authorizations.

Effects of Recreation

Under Alternative A, the Steese NCA would be managed as a SRMA. Facility enhancements, such as roads, toilets, boat ramps, and parking areas, may be added to accommodate increasing recreation demand. These enhancements would likely have limited impacts on soil or water resources.

All lands outside of the SRMA would be managed as other BLM lands; management would be custodial and result in fewer facility enhancements (such as trails or interpretive panels). Recreation user activities outside the SRMA may result in greater disturbance of soils or impacts to water quality because of limited oversight.

Effects of Travel Management

The Mount Prindle and Big Windy RNAs, and the Pinnell Mountain Trail would be closed to both winter and summer OHV use. The Primitive Management Unit and the Birch Creek WSR Corridor (142,000 acres) would be open to cross-country winter use of snowmobiles, but closed to summer OHV use. All remaining lands would be open (Maps 45, 46 and 47) to cross-country motorized travel (year-round) by vehicles with a GVWR of 1,500 pounds and less.

Alternative A would provide the most opportunity for motorized public access of any of the alternatives. Eighty-eight percent of the subunit is subject only to weight restrictions, and the remaining twelve percent is either closed or limited by season of use. This alternative provides the greatest opportunity for those seeking cross-country motorized activities, but would likely result in increased detrimental impacts to soil and water resources from proliferation of user-created trails and subsequent erosion.

4.5.1.4.2. Alternative B

Effects of Land and Realty Actions

Two transportation corridors would be retained under Alternative B. In these corridors, concentrated use would likely impact soil resources and potentially water resources, but would limit disturbance to a discrete area. Impacts to soil and water resources would be reduced through ROPs and site-specific analysis of subsequent authorizations. The Steese ACEC, the RNAs, and the Birch Creek WSR Corridor (except in the identified transportation corridor) would be

identified as right-of-way avoidance areas, and as such would provide protection for soil and water resources.

Areas closed to locatable mineral entry would provide added protection for soil and water resources in the Steese SRMA by restricting surface disturbance activities associated with mineral development.

Effects of Locatable Minerals

Under Alternative B, 1,231,000 acres would be closed and 45,000 acres would be open to locatable mineral entry (Map 31). The potential impacts to soil and water resources would increase compared to Alternative A, because new areas would be opened to mining activities and additional access routes would likely be constructed.

The number and type of placer mining operations that are estimated to occur under this alternative include one suction dredge, eight small-scale placer mines, and two large-scale mines. Actual impacts to soil and water resources from the extraction of locatable minerals would vary depending on the methods used, the size of operation and the number of mines. Placer mine operations have the potential to adversely impact soil resources and water quality through erosion of soils and fine-grain sediments and subsequent increased downstream turbidity in nearby streams. Mining operations could impact the natural flow characteristics of selected river segments. Disturbance to soil and water resources from a particular mining operation would be reduced through ROPs and site-specific analysis of subsequent authorizations.

Effects of Recreation

Under Alternative B, the Steese SRMA (1,245,000 acres), would be managed for the Primitive experiences of non-motorized use, minimal facilities development for resource protection, and small user groups. These settings would provide additional protection for soil and water resources.

Effects on BLM managed lands outside the SRMA would be similar to Alternative A in that recreation user activities may result in greater disturbance of soils or impacts to water quality because of limited oversight. General impacts to soil and water resources from recreation management activities are described under Effects Common to All Subunits.

Effects of Travel Management

Alternative B would place significantly more limits on use of OHVs than Alternative A. Under Alternative B, 3,000 acres of research natural areas, would be closed to all OHV use including snowmobiles. An estimated 1,031,000 acres would be designated as Primitive RMZ with a Limited OHV designation, which allows for winter snowmobile use. OHV use would be limited to OHVs with a curb weight of 1,000 pounds or less. Snowmobile use both on and off trails in the winter would have little effect on soil and water resources. As a result, there would be no substantial adverse impacts to soil and water resources expected under Alternative B.

A Travel Management Plan for the Steese Subunit would be completed after approval of the RMP. Measures to reduce impacts to soil and water resources include limitations on OHV use (weight and seasonal closures). Where permits may be authorized for OHV use, stipulations may be included to protect soil and water resources.

4.5.1.4.3. Alternative C

Effects of Land and Realty Actions

Effects to soil and water resources would be similar to Alternative B; two transportation corridors would be retained. However, there would be no right-of-way avoidance areas under Alternative C.

Effects of Locatable Minerals

Under Alternative C, 285,000 acres would be open to locatable minerals. Potential for placer gold is high for portions of the lands that would be opened and new development would likely occur in some areas. Projected locatable mineral development under Alternative C includes nine suction dredge operations, 15 small-scale placer mines, and four large-scale mines. Impacts would be similar to Alternative B, except they would potentially affect more acres and require additional access.

Actual impacts to soil and water resources from the extraction of locatable minerals would vary depending on the methods used, the size of operation, and the number of mines. Since more acres would be open to mineral development under Alternative C than Alternative B, there would be greater potential for adverse impacts to soil and water resources under Alternative C. Impacts would be reduced through application of ROPs and site-specific analysis of subsequent authorizations.

Effects of Recreation

Alternative C would allocate much fewer acres to Primitive RMZs and more acres to Semi-Primitive, Backcountry, Middlecountry, and Frontcountry RMZs compared to Alternative B. Middlecountry and Frontcountry Zones provide less protection to soil and water resources than do Primitive, Semi-Primitive, and Backcountry Zones. Alternative C allows for increased development of visitor facilities, landscape modifications, and larger group size. Hence, Alternative C provides less protection of soil and water resources compared to Alternative B, but more protection than Alternatives A and D.

Effects other BLM managed lands would be similar to Alternative A.

Effects of Travel Management

Under Alternative C, effects to soil and water resources would be similar to Alternative B, but somewhat greater. Three thousand acres would be designated as Primitive RMZs, closed to all OHV use. Precluding summer use of OHVs in much of the of the subunit (Maps 45, 46 and 47) and limiting OHVs to existing trails on would reduce effects compared to Alternative A.

4.5.1.4.4. Alternative D

Effects of Land and Realty Actions

Land and realty actions under Alternative D would provide the least amount of protection for soil and water resources because more lands would be open to potential ground disturbing activities such as mining and road construction. There would be no transportation corridors or right-of-way avoidance areas.

Effects of Locatable Minerals

Compared to Alternatives A, B, and C, Alternative D would open the most acres to locatable minerals, 693,000 acres. Approximately 583,000 acres would be closed. Placer gold potential is high for portions of the lands that would be opened and new development would likely occur in some areas. Projected locatable mineral development under Alternative D includes 12 suction dredge operations, 24 small-scale placer mines, and four large-scale mines.

Actual impacts from the extraction of locatable minerals would vary depending on the methods used, the size of operation and the number of mines. Since more acres would be open to mineral development under Alternative D than Alternative C, there would be greater potential for adverse impacts to soil and water resources. Impacts would be reduced through application of ROPs and site-specific analysis of subsequent authorizations.

Effects of Recreation

Alternative D would allocate slightly fewer acres to Backcountry RMZs, and more to Middlecountry compared to Alternative C. Middlecountry Zones provide less protection to soil and water resources than do Backcountry Zones. However, there would be an increased potential for adverse effects to soil resources under Alternative D relative to Alternatives B and C because there would be more emphasis on recreational infrastructure development, to encourage and enhance recreational opportunities.

Effects of Travel Management

Effects would be similar to Alternative C. Three thousand acres would be designated as Primitive RMZs, closed to all OHV use including snowmobiles. Cross-country use of OHVs with a curb weight of 1,000 pounds or less would be allowed year round in portions of the subunit (Maps 45, 46 and 47). Similar to Alternatives B and C, a Travel Management Plan would be completed after approval of the RMP.

With more cross-country summer OHV use and increased visitation, Alternative D would have more potential for adverse impacts to soil and water resources. Mitigation could include trail maintenance, seasonal travel restrictions and OHV weight restrictions to reduce the amount of disturbance to soils and water. Impacts would be reduced through application of ROPs and site-specific analysis of subsequent authorizations.

4.5.1.5. Visual Resources Steese Subunit

Summary of Effects

VRM Classes outline the level of change that could occur within that class. Identifying an area as a specific management class does not guarantee that change will take place. The discussion below identifies the number of acres that may retain or lose visual quality due to management in a specific VRM Class; however, the potential for every acre to lose visual quality due to management in a specific VRM Class is extremely low. The analysis logically assumes that areas designated as VRM Class III and IV objectives would permit more surface-disturbing impacts and potentially have greater adverse impacts on visual resources and scenic quality than those areas designated as VRM Class I and II objectives.

In addition to impacts discussed as common to all subunits in section 4.3.1.9, the following impacts may occur in the Steese Subunit. For the visual resource inventory see Appendix D, *Visual Resource Inventory*.

Alternatives — VRM Management Class Designations		VISUAL RESOURCES INVENTORY CLASS DESIGNATION							
		VRI Class I		VRI Class II		VRI Class III		VRI Class IV	
		69,000	%	1,153,000	%	25,000	%	34,000	%
Alternative A*	Acres	Acres	%	Acres	%	Acres	%	Acres	%
VRM I	69,000	69,000	6	425	<1	118	<1	68	<1
VRM II	76,000			76,000	6				
VRM III	1,066,000			1,056,000	83	8,000	<1	1,000	<1
VRM IV	0								
Total	1,211,000	69,000	6	1,132,000	94	8,000	<1	1,000	<1
*Only the Steese NCA and Birch Creek WSR have assigned VRM Classes in Alternative A.									
Alternative B	Acres	Acres	%	Acres	%	Acres	%	Acres	%
VRM I	106,000	73,000	6	21,000	2	12,000	1		
VRM II	1,139,000			1,130,000	98	8,000	<1	1,000	<1
VRM III									
VRM IV	35,000			2,000	<1			44,000	3
Total	1,292,000	73,000	6	1,153,000	90	20,000	1	45,000	3
Alternative C	Acres	Acres	%	Acres	%	Acres	%	Acres	%
VRM I	102,000	73,000	6	17,000	1	17,000	1		
VRM II	578,000			414,000	32	8,000	<1	1,000	<1
VRM III				154,000	12				
VRM IV	612,000			568,000	44			33,000	3
Total	1,292,000	73,000	6	1,153,000	90	25,000	1	34,000	3
Alternative D	Acres	Acres	%	Acres	%	Acres	%	Acres	%
VRM I	90,000	73,000	6	5,000	<1	12,000	1		
VRM II	16,000			423,000	33				
VRM III	407,000			407,000					
VRM IV	767,000			725,000	56	8,000	<1	45,000	4
Total	1,292,000	73,000	6	1,153,000	89	20,000	1	45,000	4

4.5.1.5.1. Common to All Alternatives

Cave and Karst

Management of significant caves according to federal laws and to prevent resource degradation would help maintain visual resources under all alternatives. The known cave and karst resource is located in Wolf Creek RMZ which would be managed for a Semi-Primitive to Backcountry recreation setting to preserve naturalness. These actions will help protect visual resources by maintaining the area in near natural landscape.

Effects from Wildlife

If OHV travel impacts wintering caribou by reducing use of an area, then use restrictions or closures may occur. These actions would improve visual resources by restricting or eliminating damaged to vegetation and clearing of winter trails. Changes in vegetation and clearing winter trails and travel routes from OHV use would impact visual resources by primarily changing the line, color and texture of the natural landscape. Additional discussion of impacts may be found in section 4.3.1.9 Impacts Common to All Subunits.

In all Action Alternatives, management efforts to limit density of development in the caribou migration corridor would help protect visual resources.

Effects from Travel Management

Impacts on visual resources from existing airstrips and unrestricted landings include minor changes, primarily in color and texture, on the landscape. Repeated use results in soil exposure and creates a contrast between the adjacent greens of natural vegetation and the browns and grays of exposed soil and organic materials. The removal of rocks and debris that interfere with landing aircraft may create a contrast in texture characteristics from the natural course or rough textures of diverse vegetation to the smooth uniform texture of a cleared soil area.

4.5.1.5.2. Alternative A (No Action)

Under continuation of current management, visual resources outside the Steese NCA and Birch Creek WSR Corridor would be managed based on the visual inventory class and the visual contrast rating process on a project-specific basis. Visual resource management classes have been established for lands within the Steese NCA and Birch Creek WSR Corridor.

Effects from Fish and Aquatic Species

Management activities to protect fish habitat along tributaries of Birch Creek including South Fork and its tributaries, Clums Fork, Sheep Creek and Harrington Fork, will generally help protect visual resources by restricting surface-disturbing activities on these waterways.

Effects from Visual Resources

Under Alternative A, of VRI Class I acres (five percent), one-hundred percent would continue to be managed as VRM Class I resulting in preservation of the existing visual character. These lands, the Birch Creek WSR Corridor, have an A rating for scenic quality, both high and medium sensitivity, and occur in the foreground-middle ground zone.

Of VRI Class II lands (ninety percent), less than one percent would be managed as VRM Class I resulting in preservation of the existing visual character of these lands associated with the Birch Creek WSR Corridor. Approximately six percent of VRI Class II land would be managed as VRM Class II allowing a low level of change, while eighty-three percent would be managed as VRM Class III, potentially resulting in only partial retention of landscape characteristics. These lands have an A rating for scenic quality, a high sensitivity, and occur in all three zones.

Of VRI Class III lands (two percent), less than one percent would be managed as VRM Class I resulting in preservation of the existing visual character of these lands, which are associated with the Birch Creek WSR Corridor. The remaining ninety-nine percent would be managed as VRM Class III potentially resulting in only partial retention of the characteristic landscape. These lands have a C rating for scenic quality, a high sensitivity, and occur in the occur in foreground-middle ground zones.

Less than one percent of VRI Class IV lands (three percent) will be managed as VRM Class I resulting in the preservation of the existing visual character of these lands associated with the Birch Creek WSR Corridor. Less than one percent of VRI Class IV lands will be managed as VRM Class III allowing for partial retention of the landscape characteristics. These lands have a C rating for scenic quality, both high and medium sensitivity, and occur in the occur in the Foreground-Middleground and Background zones. All of these lands are associated with both the Steese NCA and Birch Creek WSR Corridor.

Effects from Wildlife Management

Management activities for wildlife and wildlife habitat generally include restrictions on other resource use such as closing areas to mining, seasonal closures or the use of prescribed fire. Closing areas to certain surface-disturbing activities would improve visual resources by not allowing those activities. Seasonal closures may protect visual resources for the duration of the closures. Impacts from prescribed fire are addressed under Effects from Wildland Fire Ecology and Management in section 4.3.1.9. Impacts Common to All Subunits. Impacts from prescribed fire would last the longest. The size and scope would depend on the size of the closures and prescribed fire area.

Effects from Forest and Woodland Products

Under Alternative A, no commercial timber harvest is permitted within the subunit. This would protect visual resources by not allowing commercial harvest of timber to occur on 1,275,000 acres. Personal use of timber is allowed throughout the subunit. Management restrictions may include winter cutting and movement, maintaining a set distance from waterways, and lopping and scattering slash. These management restrictions would help reduce impacts to visual resources. The size and scope of impacts would depend on the size of the area and the harvest techniques used.

Effects from Lands and Realty

The four transportation corridors in the Steese NCA, encompassing 45,000 acres, allow for the concentration of access roads and possibly provide a location for other rights-of-way such as pipelines, transmission lines and associated facilities. This consolidation of rights-of-way would help protect visual resources by limiting the locations of surface disturbance and facilities development associated with these activities. If alternative rights-of-ways are necessary, the use of existing trails or travel routes would be used whenever possible. Using existing trails would reduce impacts to visual resources by using already disturbed areas.

Effects from Leasable Minerals

The entire subunit, 1,275,000 acres is closed to fluid and solid leasable minerals. Visual resources will not be impacted by the exploration or development of leasable minerals on these lands.

Effects from Locatable Minerals

The entire subunit is closed to locatable minerals through a variety of withdrawals, subject to valid existing rights. These withdrawals protect visual resources from new mining operations on 1,275,000 acres. Visual resources would only be impacted by mining on existing claims (7,000 acres). These impacts would be present in varying degree depending on the number and size of active mining operations and the degree of reclamation on existing disturbed areas. See section 4.3.1.9 Impacts Common to All Subunits for impacts to visual resources from locatable mineral activities on valid existing claims.

Under Alternative A, two large-scale placer mine operations are anticipated. The operations would have an annual footprint of 16 acres of disturbance over the 10 to 20 year life of the mine for a total of 60 to 80 acres of disturbance. Both operations would impact between 120 to 160 acres over the life of the plan. Up to seven small-scale placer mine operations are anticipated. Each with a disturbed annual footprint of 4.4 acres over the 10 to 20 year life of the mine for a total of 20 to 30 acres of disturbance. All three operations would impact 140 to 210 acres over the life of this plan. One suction dredge operation is anticipated to occur in this subunit annually. The

operation would have a camp with a footprint of less than one acre annually. In suction dredging, the movement of materials occurs underwater and thus does not have a noticeable impact to visual resources and is generally redistributed each spring during break-up or high water events.

The preference for winter cross-country moves associated with mining activities helps protect visual resources by reducing the amount of disturbance to soils and vegetation because the ground is frozen and vegetation is at least partly covered by snow. Some changes to line, form, color and texture still occurs through clearing the route of large woody vegetation in a relatively straight line on an otherwise irregular, multi-hued landscape.

Effects from Salable Minerals

The entire subunit (1,275,000 acres) would be open to salable minerals. Impacts from the mining of salable minerals are described under section 4.3.1.9. Impacts to visual resources would depend on the scale of the action and the number of mineral sites mined. While the entire subunit is open to salable minerals, it is anticipated that demand for material will be met from production on state lands and no new federal material sites are anticipated. Mining activities for salable minerals would generally occur along roads due to transportation requirements.

Effects from Recreation

Development within the Birch Creek WSR Corridor and adjacent viewshed has been minimal with the only development being at Upper and Lower Birch Creek Waysides as access points to the river. One winter trail traverses alongside upper Birch Creek within the corridor running down the river from approximately river mile 97. The corridor is maintained to retain the existing primitive character of the landscape and to meet VRM Class I objectives. Some human-made features, such as trapping cabins and inholdings, are located within the corridor. Many of these facilities were built using natural appearing materials and blend with the surrounding landscape in color. These management activities help protect the visual resources on 69,000 acres in Birch Creek WSR Corridor.

The Primitive Management Unit is managed to protect the wild and natural character of the area. Facilities such as non-motorized trails and public shelter cabins were constructed of natural appearing materials and blend with the surrounding landscape. These management activities help protect the visual resources on 64,000 acres.

The three Semi-Primitive Motorized Management Units have a number of human-made facilities, such as trails, roads, and facilities related to current or past mining and trapping activities. These facilities were constructed as sustainable and to blend with the surrounding landscape characteristics, thus protecting visual resources on 1,075,000 acres.

Effects from Travel Management

Under Alternative A, the Research Natural Areas and the Primitive Management Unit are closed to OHV use. This helps protect visual resources by preventing surface disturbance to vegetation and soils from the use of motorized vehicles, on 67,000 acres.

Management in the Birch Creek WSR Corridor allows motorized use of OHV weighing 1,500 pounds GVWR and less without permit for winter travel. This helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape, even with cross-country travel allowed, because of the frozen soils and

snow cover on lower growing vegetation. These management activities help protect the visual resources on 69,000 acres.

The Semi-Primitive Motorized Management Units all allow for unrestricted travel by OHVs weighing 1,500 pounds GVWR and less year round. This helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape, even with cross-country travel allowed, because of the frozen soils and snow cover on lower growing vegetation. These management activities help protect the visual resources on 1,075,000 acres.

The use of motorized vehicles greater than 1,500 pounds GVWR within the Steese NCA and Birch Creek WSR off a valid right-of-way may be allowed by permit. Impacts would vary depending on the size of vehicle, season of travel, and the number of passes made but, would be similar to impacts described for open cross-country travel in section 4.3.1.9.

Travel on lands outside the Steese NCA and Birch Creek WSR is unrestricted and may impact visual resources primarily by disturbing vegetation by repeated passes and by clearing travel routes. Unrestricted travel impacts 45,000 acres.

Effects from Special Designations

Under all alternatives, the Birch Creek WSR Corridor is managed to preserve the river and its immediate environment in its natural, primitive condition, in accordance with the Wild and Scenic Rivers Act (P.L. 90542). The designated corridor (69,000 acres) is managed as a VRM Class I area.

Under all alternatives, two areas have been designated as Research Natural Areas (RNAs) where no surface-disturbing activities are allowed except by permit in association with research projects. These areas are closed to OHV, camping, and mineral location and leasing. These management activities will help protect visual resources by limiting surface-disturbing activities in association with permits issued for research projects on 3,000 acres

4.5.1.5.3. Alternative B

In general, Alternative B anticipates the lowest level of resource development and adopts VRM classes that would be the most restrictive to development.

Effects from Fish and Aquatic Species

Under Alternative B, three watersheds have been identified as High Priority Restoration Watersheds and would be emphasized for restoration and/or protection. They are North Fork Birch Creek, Harrison Creek and Twelvemile Creek. Active restoration projects, such as willow plantings, seeding and fertilizing would have positive impacts to areas with surface disturbance. Changes to line, color and texture would result in that the area would be returned to a more natural looking landscape on approximately 21,000 acres.

Of VRI Class I lands (2,000 acres) one-hundred percent would be managed under Class I retaining the natural appearance of the landscape. Of VRI Class II lands, four percent or 913 acres would be managed as Class I, ninety-five percent or 19,000 acres would be managed as Class II lands while one percent (187 acres) would be managed as Class IV lands allowing a visible level of change to the landscape.

There are 21 Riparian Conservation Areas (RCAs) identified for accelerated rehabilitation of habitats which include active revegetation and streambank stabilization techniques on 561,000 acres. These activities would have a positive impact to areas with surface disturbance in returning the disturbance to a more natural looking landscape faster than natural revegetation.

Of VRI Class I lands (67,000 acres) one-hundred percent would be retained under Class I management. Of VRI Class II lands, two percent or 7,000 acres would be managed as Class I while ninety-eight percent or 463,000 acres would be managed as Class II lands. Of VRI Class III lands (8,000 acres) one-hundred percent would be managed as Class I lands. Of VRI Class IV lands one-hundred percent (16,000 acres) would be managed as Class IV lands.

Effects from Visual Resources

Under Alternative B, of VRI Class I 73,000 acres (six percent), one-hundred percent would continue to be managed as VRM Class I resulting in preservation of the existing visual character of these lands. These lands are the Birch Creek WSR Corridor and have an A rating for scenic quality, have both high and medium sensitivity, and occur in the foreground-middle ground zone.

Of VRI Class II lands (ninety percent or 1,153,000 acres), two percent or 21,000 acres would be managed as VRM Class I resulting in preservation of the existing visual character of these lands associated with the Birch Creek WSR Corridor. Approximately ninety-eight percent of VRI Class II land would be managed as VRM Class II allowing a low level of change. Less than one percent (2,000 acres) would be managed as VRM Class IV potentially resulting in a high level of change to the landscape characteristics. These lands have an A rating for scenic quality, a high sensitivity, and occur in all three zones.

Of VRI Class III lands (two percent or 20,000 acres), sixty percent would be managed as VRM Class I resulting in preservation of the existing visual character of these lands which are associated with the Birch Creek WSR Corridor. Approximately forty percent would be managed as VRM Class II allowing a low level of change to the landscape. These lands have a C rating for scenic quality, a high sensitivity, and occur in the occur in foreground-middle ground zone.

Of VRI Class IV lands (three percent or 45,000 acres) approximately three percent (1,000 acres) would be managed as VRM Class II resulting in the preservation of the existing visual character of these lands associated with the Birch Creek WSR Corridor. While ninety-seven percent or 44,000 acres would be managed as VRM Class IV potentially resulting in a high level of change to the landscape characteristics. These lands have a C rating for scenic quality, have both high and medium sensitivity, and occur in the occur in the Foreground-Middleground and Background zones.

Using design fundamentals of proper siting and location, reducing unnecessary disturbance and by repeating the landscape elements of form, line, color and texture for all surface-disturbing activities can contribute significantly in reducing impacts to visual resources, regardless of VRM Class.

Effects from Wilderness Characteristics

Visual characteristics are related to the criteria used to determine the presence of wilderness characteristics which includes naturalness. Management decisions to maintain wilderness characteristics help to preserve the visual resources of the area by limiting surface-disturbing activities and maintaining the natural vegetation and landform. Under Alternative B wilderness

characteristics will be maintained on 1,199,000 acres, limiting activities that impact the appearance of naturalness.

Of VRI Class I lands (57,000 acres) one-hundred percent would be managed under Class I retaining the natural appearance of the landscape. Of VRI Class II lands, two percent or 19,000 acres would be managed as Class I while ninety-two percent or 1,114,000 acres would be managed as Class II lands. Of VRI Class III lands (8,000 acres) one-hundred percent would be managed as Class II lands resulting in the preservation of the existing visual character of these lands. Of VRI Class IV lands one-hundred percent (1,000 acres) would be managed as Class II lands resulting in the preservation of the existing visual character of these lands.

Effects from Forest and Woodland Products

Under Alternative B, personal use of timber, timber salvage sales, commercial timber sales, and commercial use of forest products would not be allowed within the Steese SRMA (inclusive of Birch Creek WSR). Temporary camps and various impacts from different harvest techniques would not impact 1,245,000 acres. These management actions would help protect visual resources. The rest of the subunit would be open to all these types of use, potentially impacting visual resources on 45,000 acres. The size and scope of impacts would depend on the size of the area and harvest techniques used.

Effects from Land and Realty

The two transportation corridors in the Steese NCA, encompassing 52,000 acres, would continue to concentrate the building of access roads and possibly provide a location for other rights-of-way such as pipelines, transmission lines and associated facilities. This consolidation of rights-of-way would help protect visual resources by limiting the locations of surface disturbance and facilities development. Impacts of rights-of-way are described in section 4.3.1.9 Impacts Common to All Subunits.

Of VRI Class I lands, one-hundred percent (8,000 acres) would be managed as Class I lands. Of VRI Class II lands one-hundred percent (44,000 acres) would be managed as Class II lands. No lands were identified as VRI Class I or III lands.

The designation of Mount Prindle and Big Windy RNAs, the Steese ACEC, and the Birch Creek WSR Corridor as right-of-way avoidance areas, except where the transportation corridor overlaps, would protect visual resources by generally not allowing clearance of vegetation and construction of structures associated with different kinds of rights-of-ways on 90,000 acres. A natural landscape in line, form, color and texture would be maintained in these areas.

Effects from Fluid Leasable Minerals

Under Alternative B, 1,231,000 acres would be closed to fluid leasable minerals, including the Steese SRMA (inclusive of Birch Creek WSR Corridor), the Central Administrative Site, and all disposal lands. Approximately 42,000 acres of split-estate and lands near Circle would be open to fluid mineral leasing subject to no surface occupancy. These actions would protect visual resources.

Approximately 45,000 acres would be open to seismic exploration, resulting in impacts from those activities, such as green trails and the removal of vegetation in straight lines causing changes to color, line and texture. It is assumed that 130 to 212 miles of seismic line would be shot in the Yukon Flats Basin every five years. Of this, less than 20 miles would be located on BLM

lands. No development of fluid minerals is anticipated over the life of the plan. Impacts to visual resources from seismic exploration are described more fully in section 4.3.1.9.

Of VRI Class II lands, ninety-three percent (849 acres) would be managed as Class I lands with major constraints while seven percent (64 acres) would be managed as Class IV with major constraints allowing a visible level of change to the landscape. Of VRI Class IV lands one-hundred percent (44,000 acres) would be managed as Class IV lands with major constraints with 3,000 acres with no constraints. No lands were identified as VRI Class I or III lands.

Effects from Solid Leasable Minerals

The areas described above as closed to fluid leasable minerals would also be closed to solid leasable minerals. These actions would protect visual resources. Approximately 45,000 acres would be open to solid leasable minerals. However, no exploration or development of solid leasable minerals is anticipated during the life of the plan. If activity did occur, potential impacts are described in section 4.3.1.9.

Effects from Locatable Minerals

Under Alternative B, 1,231,000 acres would be closed to locatable minerals, including the Steese SRMA (inclusive of Birch Creek WSR Corridor), subject to valid existing rights. Visual resources would only be impacted by mining on 5,000 acres of valid existing claims within the closed areas. These impacts would be present in varying degrees depending on the number and size of active mining operations and the degree of reclamation on existing disturbed areas.

Remaining lands in the subunit, 45,000 acres, would be open to new locatable mineral entry. The level of mining activity is expected to increase slightly compared to Alternative A. Two large-scale placer mine operations are anticipated. Each operation would have a disturbed annual footprint of 16 acres over the life of the mine for a total of 60 to 80 acres of disturbance. Impacts from both operations would impact 120 to 160 acres over the life of this plan. Up to eight small-scale placer mine operations, one more than in Alternative A, are anticipated over the life of the plan. Each operation would have a disturbed annual footprint of 4.4 acres over the life of the mine for a total of 20 to 30 acres of disturbance. Impacts from all eight operations would impact 160 to 240 acres over the life of this plan.

Of VRI Class II lands, one-hundred percent (64 acres) would be managed as Class IV lands allowing a visible level of change to the landscape. Of VRI Class IV lands one-hundred percent (44,000 acres) would be managed as Class IV lands. No lands were identified as VRI Class I or III lands.

Impacts from suction dredging would be the same as Alternative A. Impacts from the various types of mining operations are described under section 4.3.1.9.

Effects from Salable Minerals

Under Alternative B, the Steese SRMA (including all of the Steese NCA), 1,231,000 acres, would be closed to salable minerals. Visual resources would not be impacted by mining of salable minerals on these lands. Impacts to visual resources by exploration, development and production of salable mineral resources on the remaining 45,000 acres would depend on the scale of the action and the number of mineral sites mined. Impacts from the development of salable minerals are described under section 4.3.1.9.

While 45,000 acres would be open to salable minerals, it is anticipated that demand for material will be met from production on state lands and no new federal material sites are anticipated within the subunit. Mining activities for salable minerals would generally occur along roads due to transportation requirements and BLM lands adjacent to roads are very limited.

Effects from Recreation

Recreation Management Zones (RMZs) are managed for different physical settings which include remoteness, naturalness and visitor facilities. Of these, naturalness and visitor facilities impact visual resources by setting prescriptions for management, i.e., describing the amount of naturalness and how facilities will sit on the landscape. These prescriptions include a range of Primitive, Semi-Primitive, Backcountry, Middlecountry, Frontcountry, Rural and Urban, each with different levels of naturalness and description of how facilities will sit on the landscape. Impacts from recreation management activities are described under section 4.3.1.9 Impacts Common to All Subunits.

Of VRI Class I lands, one-hundred percent (73,000 acres) would be retained under Class I management. Of VRI Class II lands two percent or 21,000 acres would be managed as Class I lands, while ninety-eight percent (1,130,000 acres) would be managed as Class II lands. Of VRI Class III lands, one-hundred percent (8,000 acres) would be managed as Class II lands. Of VRI Class IV lands one-hundred percent (1,000 acres) would be managed as Class II lands.

Under Alternative B, specially designated areas (Big Windy and Mount Prindle RNAs and Birch Creek WSR Corridor) would have a VRM Class I (107,000 acres). The Pinnell Mountain, Preacher Creek, Wolf Creek and Harrison RMZs would have a VRM Class II (1,139,000 acres). All other lands would have a VRM Class IV (35,000 acres).

Effects from Travel Management

Travel management outside the SRMA

Cross-country winter travel on 45,000 acres outside the SRMA is restricted to snowmobiles weighing 1,000 pounds curb weight and less and may impact visual resources by disturbing primarily vegetation by repeated passes and by clearing of travel routes.

All other vehicle use may be allowed by permit. Impacts would vary depending on the size of vehicle, season of travel, and the number of passes made but, would be similar to impacts described for open cross-country travel in section 4.3.1.9. Impacts Common to All Subunits.

Travel management within the SRMA

Research Natural Areas would be closed to OHV use except by permit (Map 54), helping to protect visual resources by preventing surface disturbance to vegetation and soils on 3,000 acres. The remainder of the Primitive RMZ would be closed to summer OHV use, but open to winter use of snowmobiles which may impact visual resources by disturbing vegetation.

The **Semi-Primitive and Backcountry Zones** (211,000 acres), which include the Birch Creek and Harrison RMZs, allow cross-country motorized use of OHVs weighing 1,000 pounds curb weight and less without permit for winter travel. The season of travel and weight restriction helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape even with cross-country travel allowed because of the frozen soils and snow cover on lower growing vegetation.

In all zones, vehicles that exceeded the OHV restrictions may be allowed by permit. Impacts from vehicles would vary depending on the size of vehicle, season of travel, and the number of passes made but, would be similar to impacts described for cross-country travel in section 4.3.1.9. These actions help protect visual resources by preventing surface disturbance to vegetation and soils on 1,035,000 acres.

Effects from Special Designations

Under Alternative B, 927,000 acres would be designated as the Steese ACEC to protect Fortymile caribou and Dall sheep habitat. The ACEC would be closed to leasable, locatable, and salable minerals, subject to valid existing rights. Management decisions to protect wildlife habitat helps to preserve the visual characteristics of the area. Seasonal restrictions for a one mile radius around mineral licks will limit development and use, protecting visual resources in these areas. Seasonal restrictions or closures of areas to motorized use may occur to protect habitat within the ACEC. These actions would help reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape. The Steese ACEC would be a right-of-way avoidance area, protecting visual resources by not allowing clearance of vegetation and construction of structures associated with different kinds of rights-of-ways. These actions would protect visual resources on 927,000 acres.

Land use permits and leases would be considered subject to constraints for mineral licks. The size and scope of impacts would depend on the size of the requested use and techniques used. Impacts to visual resources from rights-of-way and travel activities are described in section 4.3.1.9.

Same as Alternative A, two designated RNAs would continue with no surface-disturbing activities are allowed except by permit in association with research projects. The areas would remain closed to OHV use, camping, and mineral location and leasing. These management actions will help protect visual resources by limiting surface-disturbing activities on 3,000 acres. Development of non-motorized travel routes within the RNAs would impact visual resources on 3,000 acres. Impacts from travel routes are similar to impacts from trail construction described in section 4.3.1.9. Impacts from scientific activities are described in the same section, under Effects from Cultural Resources.

Under Alternative B, approximately 4,500 acres associated with Big Windy Creek would be maintained as a natural landscape under the eligibility as a “wild” river and would be assigned a VRM Class I to protect the naturalness of the river corridor. “Wild” rivers are essentially primitive and undeveloped. Management decisions to preserve these characteristics help to preserve the visual resources of the area by limiting surface-disturbing activities and maintaining natural vegetation and landform on a scale of development from “wild” to “recreational.”

Of VRI Class I lands, one-hundred percent or 47,000 acres would be retained under Class I management. Of VRI Class II lands, two percent (19,000 acres) would be managed as Class I lands while ninety-seven percent (861,000 acres) would be managed as Class II and less than one percent (30 acres) would be managed as Class IV allowing a visible level of change to the landscape. No lands were identified as VRI Class III or VI lands.

4.5.1.5.4. Alternative C

In general, this alternative anticipates a moderate level of resource protection, use and enhancement of resources and adopts VRM classes that would allow a range of development and still protect visual resource in certain areas.

Effects from Fish and Aquatic Species

Same as Alternative B, three watersheds have been identified as High Priority Restoration Watersheds and would be emphasized for restoration and/or protection. They are North Fork Birch Creek, Harrison Creek and Twelvemile Creek. Active restoration projects, such as willow plantings, seeding and fertilizing would have positive impacts to areas with surface disturbance. Changes to line, color and texture would result in that the area would be returned to a more natural looking landscape on approximately 21,000 acres.

Of VRI Class I lands (2,000 acres) one-hundred percent would be retained under class I management. Of VRI Class II lands, less than one percent or 33 acres would be managed as Class I, five percent or 889,000 acres would be managed as Class II lands while ninety-five percent (19,000 acres) would be managed as Class IV lands allowing a visible level of change to the landscape.

There are 18 RCAs identified for accelerated rehabilitation of habitats which include active revegetation and streambank stabilization techniques on 445,000 acres. These activities would have a positive impact to areas with surface disturbance in returning the disturbance to a more natural looking landscape faster than natural revegetation.

Of VRI Class I lands (65,000 acres) one-hundred percent would be retained under class I management. Of VRI Class II lands, four percent or 13,000 acres would be managed as Class I while thirty-nine percent or 138,000 acres would be managed as Class II lands and fifty-seven percent (205,000 acres) would be managed as Class V allowing a visible level of change to the landscape. Of VRI Class III lands (8,000 acres) one-hundred percent would be managed as Class I lands. Of VRI Class IV lands one-hundred percent (16,000 acres) would be managed as Class IV lands.

Effects from Visual Resources

Under Alternative C, of VRI Class I acres (five percent), one-hundred percent would continue to be managed as VRM Class I resulting in preservation of the existing visual character of these lands. These lands, the Birch Creek WSR Corridor, have an A rating for scenic quality, have both high and medium sensitivity, and occur in the foreground-middle ground zone.

Of VRI Class II lands (ninety percent), approximately one percent would be managed as VRM Class I resulting in preservation of the existing visual character of lands associated with the Birch Creek WSR Corridor. Approximately thirty-six percent of VRI Class II land would be managed as VRM Class II allowing a low level of change. Approximately thirteen percent would be managed as VRM Class III potentially resulting in partial retention of the characteristic landscape. Approximately forty-nine percent would be managed as VRM Class IV potentially resulting in a high level of change to the landscape characteristics. These lands have an A rating for scenic quality, a high sensitivity, and occur in all three zones. The majority of visual impacts would result from mineral development.

Of VRI Class III lands (two percent), 67 percent would be managed as VRM Class I resulting in preservation of the existing visual character. These lands are associated with the Birch Creek WSR Corridor. Approximately thirty-three percent would be managed as VRM Class II allowing a low level of change to the landscape. These lands have a C rating for scenic quality, a high sensitivity, and occur in the occur in foreground-middle ground zone.

Approximately four percent of VRI Class IV lands (three percent) will be managed as VRM Class II resulting in the preservation of the existing visual character of these lands associated with the Birch Creek WSR Corridor. While ninety-six percent would be managed as VRM Class IV potentially resulting in a high level of change to the landscape characteristics. These lands have a C rating for scenic quality, have both high and medium sensitivity, and occur in the Foreground-Middleground and Background zones.

Using design fundamentals of proper siting and location, reducing unnecessary disturbance and by repeating the landscape elements of form, line, color and texture for all surface-disturbing activities can contribute significantly in reducing impacts to visual resources, regardless of VRM Class.

Effects from Wilderness Characteristics

Visual characteristics are related to the criteria used to determine the presence of wilderness characteristics which includes naturalness. Management decisions to preserve wilderness characteristics help to preserve the visual resources of the area by limiting surface-disturbing activities and maintaining natural vegetation and landform. Under Alternative C, wilderness characteristics would be maintained on 647,000 acres, limiting activities that impact the appearance of naturalness.

Of VRI Class I lands (57,000 acres) one-hundred percent would be managed as Class I retaining the natural appearance of the landscape. Of VRI Class II lands, three percent or 15,000 acres would be managed as Class I while ninety-seven percent (565,000 acres) would be managed as Class II lands. Of VRI Class III lands, one-hundred percent or 8,000 acres would be managed as Class II lands. Of VRI Class IV lands one-hundred percent (1,000 acres) would be managed as Class II lands resulting in preservation of the existing visual character of these lands.

Effects from Forest and Woodland Products

Personal use of timber, commercial timber sales, and commercial use of forest products would not be allowed within the Birch Creek WSR Corridor and the RNAs. Temporary camps and various impacts from different harvest techniques would not impact 72,000 acres. These management actions would help protect visual resources. The rest of the subunit, 1,000,000 acres would be open to all these uses, allowing the potential for impacts to visual resources. The size and scope of impacts would depend on the size of the area and harvest techniques used. Additionally, commercial timber sales are unlikely under any alternative, due to lack of access and lack of valuable timber.

Timber salvage sales would be considered throughout the subunit. The size and scope of impacts would depend on the size of the area and harvest techniques used. Temporary camps and various impacts from different harvest techniques could occur in localized areas within the 1,275,000 acres open to salvage sales. Impacts are discussed in section 4.3.1.9 Impacts Common to All Subunits.

Effects from Land and Realty

The two transportation corridors in the Steese NCA, encompassing 52,000 acres, would continue to concentrate the building of access roads and possibly provide a location for other rights-of-way such as pipelines, transmission lines and associated facilities. This consolidation of rights-of-way would help protect visual resources by limiting the locations of surface disturbance and facilities

development. Impacts of rights-of-way are described in section 4.3.1.9 Impacts Common to All Subunits.

Of VRI Class I lands, one-hundred percent (8,000 acres) would be managed as Class I lands. Of VRI Class II lands fourteen percent (6,000 acres) would be managed as Class II lands while eighty-six percent or 38,000 acres would be managed as Class IV allowing a visible level of change to the landscape. No lands were identified as VRI Class III or IV lands.

Effects from Fluid Leasable Minerals

Under Alternative C, 992,000 would be closed to fluid leasable minerals, protecting visual resources in these areas (Map 34). Closed areas include the Birch Creek WSR Corridor, RNAs, and approximately sixty-five percent of the Steese NCA.

Approximately 214,000 acres in Preacher Creek and Clums RMZs, and lands around Circle would be open to fluid mineral leasing subject to minor constraints (e.g., seasonal closures). Additionally, 71,000 acres would be open. Open areas include portions of Harrison RMZ and split-estate land and would be subject to standard stipulations.

Lands open to leasing would also be open to exploration resulting in impacts from those activities, such as green trails and the removal of vegetation in straight lines causing changes to color, line and texture. Effects from seismic exploration would be the same as Alternative B.

No lands open for leasable minerals were identified as VRI Class I or III lands. Of VRI Class II lands, one-hundred percent or 241,000 acres would be managed as Class IV lands allowing a visible level of change to the landscape. Of VRI Class IV lands, one-hundred percent or 44,000 acres would be managed as Class IV lands allowing a visible level of change to the landscape.

Effects from Solid Leasable Minerals

Under Alternative C, the areas described as closed to fluid leasable minerals would also be closed to solid leasable minerals. These actions would protect visual resources. Approximately 500,000 acres would be open to solid leasable minerals. However, no exploration or development of solid leasable minerals is anticipated during the life of the plan. If activity did occur, the impacts that could potentially occur in open areas are described in section 4.3.1.9.

Effects from Locatable Minerals

Under Alternative C, 992,000 acres would be closed to locatable minerals, protecting visual resources in these areas (Map 33). Closed areas include the Birch Creek WSR Corridor, the RNAs, Harrison Creek reclamation area (3,500 acres), and approximately sixty-five percent of the Steese NCA. This action would protect visual resources by not allowing surface-disturbing activities associated with mineral development.

All the remaining lands in the subunit (285,000 acres) would be open to locatable minerals. Levels of mining activity would increase substantially compared to Alternatives A and B. Four large-scale placer mine operations are anticipated. Each operation would have a disturbed annual footprint of 16 acres over the 10 to 20 year life of the mine for a total of 60 to 80 acres of disturbance. All four operations would impact 240 to 320 acres over the life of this plan. Up to 18 small-scale placer mine operations are anticipated. Each operation would have a disturbed annual footprint of 4.4 acres over the 10 to 20 year life of the mine for a total of 20 to 30 acres of

disturbance. All 18 operations would impact between 360 to 540 acres (less than one percent of the subunit) over the life of this plan.

Mineral exploration activities with resulting camp and field sampling would impact visual resources on between six to 104 acres annually. Reclamation would generally occur annually with the only impacts to visual resources from camps. Up to two exploration operations may occur over the life of this plan.

Impacts from suction dredging would be similar to Alternative A, but would affect a larger area as up to nine suction dredge operations are anticipated annually under Alternative C. The movement of materials occurs underwater and thus does not have a noticeable impact to visual resources and is generally redistributed each spring during break-up or high water events. Impacts from camps are anticipated to be less than nine acres annually. Impacts from the various types of mining operations are described in section 4.3.1.9.

No lands open for locatable minerals were identified as VRI Class I or III lands. Of VRI Class II lands, one-hundred percent or 241,000 acres would be managed as Class IV lands allowing a visible level of change to the landscape. Of VRI Class IV lands, one-hundred percent or 44,000 acres would be managed as Class IV lands allowing a visible level of change to the landscape.

Effects from Salable Minerals

Under Alternative C, the Birch Creek WSR Corridor (69,000 acres) would be closed to salable minerals thus there would be no impact on these lands.

Impacts to visual resources by production of salable mineral resources on the remaining 1,207,000 acres would depend on the scale of the action and the number of mineral sites mined. While ninety-five percent of the subunit is open to salable minerals it is anticipated that demand for material will generally be met from production on state lands and no new federal material sites are anticipated. Impacts to visual resources by the development of salable minerals are described under section 4.3.1.9.

Effects from Recreation

Recreation Management Zones (RMZs) are managed for different physical settings which include remoteness, naturalness and visitor facilities. Of these, naturalness and visitor facilities impact visual resources by setting prescriptions for management, i.e., describing the amount of naturalness and how facilities will sit on the landscape. These prescriptions range from Primitive, Semi-Primitive, Backcountry, Middlecountry, Frontcountry, Rural and Urban, each with different levels of naturalness and description of how facilities will sit on the landscape.

Of VRI Class I lands (73,000 acres) one-hundred percent would be managed under Class I retaining the natural appearance of the landscape. Of VRI Class II lands, two percent or 17,000 acres would be managed as Class I, forty-nine percent or 569,000 acres would be managed as Class II lands while forty-nine percent (566,000 acres) would be managed as Class IV lands allowing a visible level of change to the landscape. Of VRI Class II lands sixty percent or 12,000 acres would be managed under Class I retaining the natural appearance of the landscape while forty percent (8,000 acres) would be managed under Class II preserving the existing visual character of these lands. Of VRI Class IV lands one-hundred percent (1,000 acres) would be managed as Class II lands preserving the existing visual character of these lands.

Under Alternative C, Big Windy and Mount Prindle RNAs and Birch Creek RMZ would have a VRM Class I (approximately 102,000 acres). Semi-Primitive Zones including Pinnell Mountain, Wolf Creek, Rocky Mountain, and Rock Creek RMZs would have a VRM Class II (587,000 acres). All other lands would have a VRM Class IV (611,000 acres).

Effects from Travel Management

Travel management outside the SRMA

Under Alternative C, summer travel by OHVs weighing 1,000 pounds curb weight and less are allowed on existing routes only, except to retrieve legally harvested game. This helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape because travel is limited to hardened existing routes except for game retrieval. Multiple passes over the same travel route for the retrieval of game could cause changes in color, line, and texture on the landscape. Repeated OHV use leads to destruction of vegetation, which in turn results in soil exposure, creating a contrast between the adjacent greens of natural vegetation and the browns and grays of exposed soil and organic materials. A contrast in line occurs when the irregular characteristics of vegetation is altered by a more regular line in the form of a developed route or constructed trail. Texture characteristics change from the natural course or rough textures of diverse vegetation to the smooth uniform texture of a developed trail, trail hardening techniques, or mineral soil area. These management activities would help protect the visual resources on 45,000 acres.

Vehicles weighing less than 10,000 pounds curb weight but more than 1,000 pounds curb weight would be allowed on existing roads only. This would protect visual resources by restricting use of larger vehicles to already hardened areas. All other vehicle use may be allowed under permit. Impacts would vary depending on the size of vehicle, season of travel, and the number of passes made but, would be similar to impacts described for open cross-country travel and unrestricted aircraft landings in section 4.3.1.9.

Travel management within the SRMA

Under Alternative C, the **Primitive Zones** would be closed to OHV use except by permit. This helps protect visual resources by preventing surface disturbance to vegetation and soils from the use of motorized vehicles, on 3,000 acres.

The **Semi-Primitive and Backcountry Zones** (578,000 acres), which include the Birch Creek, Pinnell Mountain, Wolf Creek, Rock Creek, and Rocky Mountain Uplands RMZs, allow cross-country motorized use of OHV weighing 1,000 pounds curb weight and less without permit for winter travel. The season of travel and weight restriction helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape, even with cross-country travel allowed, because of the frozen soils and snow cover on lower growing vegetation.

Impacts to visual resources in the **Middlecountry and Frontcountry Zones**, which include the Preacher Creek, Clums, and Harrison RMZs, would be similar to that described above for *Travel management outside the SRMA*. Cross-country winter travel with motorized vehicles of 1,000 pounds curb weight and less would be allowed and may impact visual resources by disturbing vegetation by repeated passes and by clearing of travel routes as described in section 4.3.1.9. Impacts from cross-country winter travel may occur on 566,000 acres.

Summer travel with OHVs weighing 1,000 pounds curb weight and less is allowed on existing routes only, except to retrieve legally harvested game. This helps reduce the amount of surface disturbance as described above under *Travel management outside the SRMA*. Vehicles weighing less than 10,000 pounds curb weight but greater than 1,000 pounds curb weight would be allowed on existing roads only, protecting visual resources by restricting use to already hardened areas. These management actions would help protect the visual resources on 566,000 acres.

In all zones, the use of vehicles exceeding the OHV restrictions may be allowed by permit. The impacts from vehicles would vary depending on the size of vehicle, season of travel, and the number of passes made. Impacts from these uses would be similar to those described for open cross-country travel in section 4.3.1.9.

Effects from Special Designations

Under Alternative C, 460,000 acres would be designated as the Steese ACEC to protect caribou and Dall sheep habitat. Effects would be the same as Alternative B, except the ACEC would be smaller. Management decisions to protect wildlife habitat helps to preserve the visual characteristics of the area. The ACEC will remain closed to leasable and locatable minerals, subject to valid existing rights. Seasonal restrictions for a one mile radius around mineral licks will limit development and use, protecting visual resources in these areas. Seasonal restrictions or closures of areas to motorized use may occur to protect habitat. These actions would help reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape to 460,000 acres.

Salable minerals, land use permits, and leases could be authorized in the ACEC subject to constraints for mineral licks, but are unlikely. The size and scope of impacts would depend on the size of the requested use and techniques used. Impacts to visual resources from travel and various land uses are described in section 4.3.1.9.

Same as Alternatives A and B, two designated RNAs would continue with no surface-disturbing activities allowed except by permit in association with research projects. The areas would remain closed to OHV and mineral location and leasing. These management activities would help protect visual resources by limiting surface-disturbing activities to those associated with permits issued for research projects on 3,000 acres.

Development of non-motorized trails within the RNAs would impact visual resources on 3,000 acres. Most trails would attract attention of the casual observer if viewed from a higher observation point and if the trails were located within the Foreground-Middleground and Background zones. Trails or routes that are properly designed and viewed from ground level, however, would not generally attract the attention of a casual observer, with the exception from trailhead observation points. Primitive camping would be allowed under this alternative. Visual Impacts from trail construction and temporary camps are described under Effects from Travel Management in section 4.3.1.9.

Of VRI Class II lands, one percent or 3,000 acres would be managed as Class I, eighty-two percent or 377,000 acres would be managed as Class II lands while seventeen percent (80,000 acres) would be managed as Class IV lands allowing a visible level of change to the landscape. No lands were identified as VRI Class I, III or IV lands.

Under Alternative C, Big Windy Creek would not be recommended as suitable for designation as a WSR, thus there would be no effects.

4.5.1.5.5. Alternative D

In general, this alternative anticipates the greatest amount of resource development and adopts the least restrictive VRM classes that would allow major development while protecting visual resources in certain areas.

Effects from Fish and Aquatic Species

Same as Alternative B, three watersheds have been identified as High Priority Restoration Watersheds and would be emphasized for restoration and/or protection. They are North Fork Birch Creek, Harrison Creek and Twelvemile Creek. Active restoration projects, such as willow plantings, seeding and fertilizing would have positive impacts to areas with surface disturbance. Changes to line, color and texture would result in that the area would be returned to a more natural looking landscape on approximately 21,000 acres.

Of VRI Class I lands (2,000 acres) one-hundred percent would be managed under Class I retaining the natural appearance of the landscape. Of VRI Class II lands, less than one percent or 233 acres would be managed as Class I, five percent or 889 acres would be managed as Class II lands while ninety-five percent (19,000 acres) would be managed as Class IV lands allowing a visible level of change to the landscape.

There are eight RCAs identified for accelerated rehabilitation of habitats which include active revegetation and streambank stabilization techniques on 205,000 acres. These activities would have a positive impact to areas with surface disturbance in returning the disturbance to a more natural looking landscape faster than natural revegetation.

Of VRI Class I lands (65,000 acres) one-hundred percent would be managed under Class I retaining the natural appearance of the landscape. Of VRI Class II lands, two percent or 2,000 acres would be managed as Class I while forty-four percent or 56,000 acres would be managed as Class II lands and fifty-four percent or 69,000 acres would be managed as Class IV allowing a visible level of change to the landscape. Of VRI Class III lands (8,000 acres) one-hundred percent would be managed as Class I lands. Of VRI Class IV lands one-hundred percent (5,000 acres) would be managed as Class IV lands.

Effects from Visual Resources

Under Alternative D, of VRI Class I acres (six percent or 73,000 acres), one-hundred percent would continue to be managed as VRM Class I resulting in preservation of the existing visual character. These lands, the Birch Creek WSR Corridor, have an A rating for scenic quality, have both high and medium sensitivity, and occur in the foreground-middle ground zone.

Of VRI Class II lands (eighty-nine percent or 1,153,000 acres), less than one percent (5,000 acres) would be managed as VRM Class I resulting in preservation of the existing visual character of these lands associated with the Birch Creek WSR Corridor. Approximately thirty-seven percent or 423,000 acres of VRI Class II land would be managed as VRM Class II allowing a low level of change, while sixty-three percent would be managed as VRM Class IV potentially resulting in a high level of change to the landscape characteristics. These lands have an C rating for scenic quality, a high sensitivity, and occur in foreground-middle ground zone. The majority of visual impacts would result from mineral development.

Of VRI Class III lands (two percent or 20,000), approximately sixty percent would be managed as VRM Class I resulting in preservation of the existing visual character of these lands associated with the Birch Creek WSR Corridor. Approximately forty percent would be managed as VRM Class IV potentially resulting in a high level of change to the landscape. These lands have a C rating for scenic quality, a high sensitivity, and occur in the foreground-middle ground zone.

Approximately one-hundred percent of VRI Class IV lands (three percent or 45,000 acres) will be managed as VRM Class IV potentially resulting in a high level of change to the landscape characteristics. These lands have a C rating for scenic quality, have both high and medium sensitivity, and occur in the Foreground-Middleground and Background zones.

Using design fundamentals of proper siting and location, reducing unnecessary disturbance and by repeating the landscape elements of form, line, color and texture for all surface-disturbing activities can contribute significantly in reducing impacts to visual resources, regardless of VRM Class.

Effects from Wilderness Characteristics

Visual characteristics are related to the criteria used to determine the presence of wilderness characteristics which includes naturalness. Management decisions to preserve wilderness characteristics help to preserve the visual resources of the area by limiting surface-disturbing activities and maintaining natural vegetation and landform. Under Alternative D, wilderness characteristics would be maintained on 483,000 acres, limiting activities that impact the appearance of naturalness.

Of VRI Class I lands (57,000 acres) one-hundred percent would be managed under Class I retaining the natural appearance of the landscape. Of VRI Class II lands, one percent or 3,000 acres would be managed as Class I, ninety-nine percent or 423,000 acres would be managed as Class II lands. No lands were identified as VRI Class III or IV lands.

Effects from Forest and Woodland Products

Under Alternative D, commercial timber sales and commercial use of forest products would not be allowed within the Birch Creek WSR, and RNAs. Temporary camps and various impacts from different harvest techniques would not impact 72,000 acres. These management actions would help protect visual resources. The rest of the subunit would be open to these uses. The size and scope of impacts would depend on the size of the area and harvest techniques used. Temporary camps and various impacts from different harvest techniques could impact localized areas within the 1,191,000 acres open to these uses. As in Alternative C, commercial timber sales would be unlikely.

The entire subunit would be open to personal use timber and timber salvage sales, potentially impacting visual resources on 1,281,000 acres. The size and scope of impacts would depend on the size of the area and harvest techniques used.

Effects from Land and Realty

Under Alternative D, no transportation corridors would be identified, potentially resulting in increased impacts to visual resources.

Effects from Fluid Leasable Minerals

Under Alternative D, 583,000 would be closed to fluid leasable minerals, protecting visual resources in these areas (Map 36). Closed areas include the Birch Creek WSR Corridor, the RNAs, and approximately fifty percent of the Steese NCA.

Approximately 524,000 acres would be open to fluid mineral leasing subject to minor constraints such as seasonal closures. Minor constraints would protect visual resources by limiting surface disturbance activities associated with fluid minerals at least seasonally. An additional 169,000 acres would be open to exploration subject to standard stipulations. No development of fluid minerals is anticipated over the life of the plan. In open areas, impacts such as creation of green trails and the removal of vegetation in straight lines causing changes to color, line and texture, could occur. Exploration could occur in open areas. Although a larger area would be open, impacts from seismic exploration would be the same as Alternative B.

No lands open for leasable minerals were identified as VRI Class I lands. Of VRI Class II lands, one-hundred percent or 530,000 acres would be managed as Class IV allowing a visible level of change to the landscape. Of VRI Class III lands one-hundred percent or 8,000 acres would be managed as Class IV lands allowing a visible level of change to the landscape. Of VRI Class IV lands one-hundred percent (44,000 acres) would be managed as Class IV lands allowing a visible level of change to the landscape.

Effects from Solid Leasable Minerals

Under Alternative D, the areas described as closed to fluid mineral leasing above, would also be closed to solid leasable minerals. These actions would protect visual resources. Approximately 693,000 acres would be open to solid mineral leasing, of this 524,000 acres would be subject to minor constraints such as seasonal closures. Minor constraints would protect visual resources by limiting surface disturbance activities at least seasonally. Although 693,000 acres would be open, no solid mineral exploration or leasing is anticipated during the life of the plan.

Effects from Locatable Minerals

Under Alternative D, 583,000 would be closed to locatable minerals, protecting visual resources in these areas (Map 35). Closed areas include the Birch Creek WSR Corridor, the RNAs, and approximately fifty-four percent of the Steese NCA. This would protect visual resources by not allowing surface-disturbing activities associated with mineral development. The reclaimed areas in Harrison Creek would not be closed. Increasing the potential for impacts to visual resources in this area.

Approximately 693,000 acres in the Harrison RMZ, Preacher Creek RMZ and portions of Clums RMZ within the Steese NCA would be open to locatable minerals. The level of mining activity, particularly small-scale placer mines and suction dredging operations, would increase compared to Alternative C.

Four large-scale placer mine operations are anticipated. Each operation would have a disturbed annual footprint of 16 acres over the 10 to 20 year life of the mine for a total of 60 to 80 acres of disturbance. All four operations would impact 240 to 320 acres over the life of this plan. Up to 24 small-scale placer mine operations are anticipated. Each operation would have a disturbed annual footprint of 4.4 acres over the 10 to 20 year life of the mine for a total of 20 to 30 acres of disturbance. All eighteen operations would impact 480 to 720 acres, less than one percent of the planning area, over the life of the plan.

Mineral exploration activities with resulting camp and field sampling would impact visual resources on between 6 to 156 acres annually. Reclamation would generally occur annually with the only impacts to visual resources from camps. Up to three exploration operations may occur over the life of this plan.

Impacts from suction dredging would be similar to Alternatives A, B, and C but would affect a larger area. Approximately 12 suction dredge operations are anticipated annually, each with a camp footprint of less than one acre. The movement of materials occurs underwater and thus does not have a noticeable impact to visual resources and is generally redistributed each spring during break-up or high water events. Impacts from camps associated with suction dredging are anticipated to be less than 12 acres annually over the life of the plan. Impacts from the various types of mining operations are described under section 4.3.1.9.

No lands open for locatable minerals were identified as VRI Class I. Of VRI Class II lands, one-hundred percent or 652,000 acres would be managed as Class IV lands allowing a visible level of change to the landscape. Of VRI Class III lands, one-hundred percent or 8,000 acres would be managed as Class IV lands allowing a visible level of change to the landscape. Of VRI Class IV lands, one-hundred percent or 45,000 acres would be managed as Class IV lands allowing a visible level of change to the landscape.

Effects from Salable Minerals

Same as Alternative A.

Effects from Recreation

Recreation Management Zones are managed for different physical settings which include remoteness, naturalness and visitor facilities. Of these, naturalness and visitor facilities impact visual resources by setting prescriptions for management, i.e., describing the amount of naturalness and how facilities will sit on the landscape. These prescriptions provide a range from Primitive, Semi-Primitive, Backcountry, Middlecountry, Frontcountry, Rural and Urban, each with different levels of naturalness and description of how facilities will sit on the landscape.

Of VRI Class I lands (73,000 acres) one-hundred percent would be managed under Class I retaining the natural appearance of the landscape. Of VRI Class II lands, less than one percent or 5,000 acres would be managed as Class I, thirty-seven percent or 42,000 acres would be managed as Class II lands while sixty-three percent (723,000 acres) would be managed as Class IV lands allowing a visible level of change to the landscape. Of VRI Class III lands one-hundred percent (8,000 acres) would be managed as Class IV lands allowing a visible level of change to the landscape. Of VRI Class IV lands, one-hundred percent or 1,000 acres would be managed as Class IV lands.

Under Alternative D, the RNAs and Birch Creek WSR Corridor (90,000 acres) would have a VRM Class I. The Semi-Primitive Pinnell Mountain RMZ would have a VRM Class II (16,000 acres). Wolf Creek and Rocky Mountain Uplands Backcountry RMZs would have a VRM Class II (407,000 acres). All other lands would have a VRM Class IV (767,000 acres).

Effects from Travel Management

Travel management outside the SRMA

Under Alternative D, open cross-country travel on BLM lands, outside of the Steese NCA and Birch Creek WSR Corridor, is restricted to motorized vehicles 1,000 pounds curb weight and less year round, and may impact visual resources primarily by disturbing vegetation by repeated passes and by clearing of travel routes. Vehicles weighing less than 10,000 pounds curb weight would be allowed on existing roads only, protecting visual resources by restricting use to already hardened areas. Weight restricted travel impacts 45,000 acres.

All other vehicle use may be allowed under permit. The impacts would vary depending on the size of vehicle, season of travel, and the number of passes made, but would be similar to impacts described for open cross-country travel in section 4.3.1.9.

Travel management within the SRMA

Impacts to visual resources from travel in the **Primitive Zones** (3,000 acres) would be the same as Alternative C.

The **Semi-Primitive and Backcountry Zones** (510,000 acres), which include the Birch Creek, Pinnell Mountain, Rocky Mountain Uplands, and Wolf Creek RMZs, allow winter cross-country motorized use of OHV weighing 1,000 pounds curb weight and less without permit. All other vehicle use may be allowed under permit. These season of travel and weight restrictions help reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape, even with cross-country travel allowed, because of the frozen soils and snow cover on lower growing vegetation.

The **Middlecountry and Frontcountry Zones**, which include the Preacher Creek, Clums, and Harrison RMZs, allow for open cross-country travel, year round, with motorized vehicles 1,000 pounds curb weight or less. Cross-country travel impacts visual resources by disturbing vegetation by repeated passes and by clearing travel routes. Vehicles weighing less than 10,000 pounds curb weight would be allowed on existing roads only. This would protect visual resources by restricting use to already hardened areas. These management actions impact 733,000 acres.

In all zones, other vehicle use may be allowed under permit. Impacts would vary depending on the size of vehicle, season of travel, and the number of passes made but, would be similar to impacts from cross-country travel described in section 4.3.1.9.

Effects from Special Designations

Areas of Critical Environmental Concern

Under Alternative D, 193,000 acres would be designated as the Steese ACEC to protect caribou and Dall sheep habitat. Management decisions to protect wildlife habitat helps to preserve the visual characteristics of the area. The effects would be the same as Alternatives B and C but would apply to fewer acres because the ACEC is smaller. The ACEC will remain closed to leasable and locatable minerals, subject to valid existing rights. Seasonal restrictions for a one-half mile radius around mineral licks will limit development and use in these areas. Seasonal restrictions or closures of areas to motorized use may occur to protect habitat. These actions would help reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape to 193,000 acres.

Salable minerals, land use permits, and leases could be authorized subject to constraints for mineral licks, but would be unlikely. The size and scope of impacts would depend on the size of

the requested use and techniques used. Impacts to visual resources from travel and various land uses are described in section 4.3.1.9.

Of VRI Class II lands, sixty-four percent or 123,000 acres would be managed as Class II while thirty-six percent or 69,000 acres would be managed as Class IV lands allowing a visible level of change to the landscape. No lands were identified as VRI Class I, III or IV lands.

Effects from RNAs and Wild and Scenic Rivers would be the same as Alternative C.

4.5.1.6. Wilderness Characteristics Steese Subunit

Summary of Effects

There are 1,270,000 acres identified within the Steese Subunit as having wilderness characteristics of size, naturalness, and the opportunity for solitude or a primitive unconfined type of recreation experience. Managing lands for wilderness characteristics limit surface-disturbing activities. See section 4.3.1.10 Impacts Common to All Subunits for impacts to wilderness characteristics. Alternative B would protect the most acres for wilderness characteristics while Alternative A would not identify any acres as having wilderness characteristics. Alternative C provides a balance between protection and resource use, while Alternative D provides for resource development and protects the least amount of lands for wilderness characteristics.

4.5.1.6.1. Alternative A (No Action)

Effects from Wilderness Characteristics

No lands are managed for wilderness characteristics under this alternative. Of the 1,270,000 acres identified as having wilderness characteristics, none would be directly managed to protect those values. Other actions and management strategies may help protect those values indirectly, such as managing for a Primitive or Semi-Primitive recreation opportunity.

4.5.1.6.2. Alternative B

Effects from Wilderness Characteristics

Of the 1,270,000 acres identified as having wilderness characteristics, 1,199,000 acres (ninety-four percent) would be directly managed to protect those values. These areas include the majority of the Steese SRMA, except the Birch Creek WSR Corridor outside the Steese NCA. Other actions and management strategies may help protect those values indirectly on the remaining 71,000 acres. Mineral exploration or development is possible on 45,000 acres and on existing mining claims. However the reasonably foreseeable development scenario does not suggest a high percentage of development during the life of the plan. Even if all development is realized it would affect less than one percent of all available acres. If these claims were developed naturalness would be impacted within the view shed of the development until the site was reclaimed to the extent that it appeared natural looking see section 4.3.1.10 Impacts Common to All Subunits.

4.5.1.6.3. Alternative C

Effects from Wilderness Characteristics

Of the 1,270,000 acres identified as having wilderness characteristics, 647,000 acres (fifty-one percent) would be directly managed to protect those values. These areas include Primitive, Semi-Primitive, except Birch Creek RMZ below the Steese NCA boundary, and Backcountry RMZs. Other actions and management strategies may help protect those values indirectly on the remaining 623,000 acres. Mineral exploration or development is possible on 285,000 acres. However the reasonably foreseeable development scenario does not suggest a high percentage of development during the life of the plan. Even if all development is realized it would affect less than one percent of all available acres. If these claims were developed naturalness would be impacted within the view shed of the development until the site was reclaimed to the extent that it appeared natural looking. Development of recreation facilities and travel management in Middlecountry and Frontcountry RMZs, and on other BLM lands would also impact wilderness characteristics.

4.5.1.6.4. Alternative D

Effects from Wilderness Characteristics

Of the 1,270,000 acres identified as having wilderness characteristics, 483,000 acres (thirty-eight percent) would be directly managed to protect those values. These areas include Primitive, Semi-Primitive, except Birch Creek RMZ below the Steese NCA boundary, and Backcountry RMZs. Other actions and management strategies may help protect those values indirectly on 787,000 acres. Mineral exploration or development is possible on 693,000 acres however the reasonably foreseeable development scenario does not suggest a high percentage of development during the life of the plan. Even if all development is realized it would affect less than one percent of all available acres. If these claims were developed naturalness would be impacted within the view shed of the development until the site was reclaimed to the extent that it appeared natural looking. Development of recreation facilities and travel management in Middlecountry and Frontcountry would also impact wilderness characteristics.

4.5.1.7. Wildlife Steese Subunit

Summary of Effects

Management of recreation in Alternative C would result in positive effects to wildlife (relative to Alternative A), as most key wildlife habitats would be in Primitive, Semi-Primitive or Backcountry RMZs. The restriction of summer OHVs to existing trails in Alternatives B and C would also benefit wildlife relative to Alternative A. Alternative C would open nearly 285,000 acres to locatable and leasable minerals which would negatively affect wildlife habitats, but designate ACECs which would provide protection to many key wildlife habitats, including caribou calving habitats. Overall impacts to wildlife would be lowest in Alternative B, next lowest in Alternative A, and highest in Alternative D. Potential cumulative impacts in Alternatives C and D include impairment of migratory caribou habitats.

4.5.1.7.1. Alternative A (No Action)

Effects from Wildlife

Present and historical caribou habitat will be managed as a primary land use in this and all alternatives. There is no specific provision in this alternative to monitor or limit off-trail snowmobile use in caribou habitat, and a caribou migration habitat corridor is not identified.

Effects from Leasable Minerals

None of the subunit is open to leasing.

Effects from Locatable Minerals

The entire subunit is currently closed to mineral location and entry. Small- and large-scale placer mining occurs on hundreds of pre-existing mineral claims (totalling 7,000 acres, of which 5,000 acres are in the Steese NCA). Many valid claims exist along streams in the Clum's Fork area and areas north of Birch Creek, with scattered claims in other areas. Impacts of mining at current levels involves localized disturbance of wildlife and habitats by road, trails, and mining operations and the period of recovery of riparian and aquatic habitats is typically long (see Fish and Aquatic Species section 4.3.1.4 for more description of impacts to these habitats). Roads and trails result in increased off-trail OHV use by recreationists. Under this alternative, some additional mining is likely if minerals prices increase, or if additional access is created.

Effects from Recreation

Existing recreational use and management in the Steese NCA has focused on Birch Creek WSR, Pinnell Mountain Trail, and highway waysides. Dispersed recreation use occurs from hikers in the Mount Prindle area, and OHV users in portions of Preacher Creek and in the south Steese NCA unit (north of Birch Creek). Only the Primitive Management Unit (adjacent to the White Mountains NRA), the Pinnell Mountain Trail, and the Birch Creek WSR Corridor are closed to summer OHV use. In the areas open to summer OHVs, cross-country travel is allowed, which has created a network of trails. Summer OHV use in the area south of Birch Creek WSR Corridor generally does not occur due to lack of access. This area is rarely visited at any time of year; most use likely occurs by snowmobile in winter and includes some trapping activity. Winter snowmobile use is not restricted anywhere in the subunit, except in the RNAs.

Under Alternative A, recreation affects wildlife primarily along the Pinnell Mountain Trail, Birch Creek, Mount Prindle, and in areas of OHV use. Wildlife is displaced, at least temporarily, by recreational activities, and that effect is greatest at sites of higher recreational use. Disturbance of nesting raptors can potentially lead to nest abandonment or reduced survival of nestlings and likely occurs at times along Birch Creek. Bears can be attracted to garbage which can lead to conflicts and potential removal. Recreational OHV users are becoming more abundant and are traveling further and expanding the zone of impact. User-pioneered trails have expanded into remote portions of the north Steese NCA, including the upper North Fork of Preacher Creek. Motor boat use on lower Birch Creek results in wildlife disturbance, including potential impacts to a few nesting bald eagles.

Effects from Travel Management

Most of the subunit (all but the Primitive Management Unit in the north Steese NCA, RNAs, Pinnell Mountain Trail and Birch Creek WSR Corridor) is open to cross-country OHV travel and susceptible to the impacts of cross-country travel described in the section 4.3.1.12 Impacts Common to all Subunits. The area to the south of the Birch Creek WSR Corridor, although open to OHVs, has received very little use due to the inability to legally cross Birch Creek and the remoteness. If access were developed to the unit from the south, OHV use would likely occur in that area. Development of motorized access within any of the subunit would expand the intensity and area of OHV use. All areas except RNAs are open for snowmobile use and extensive off-trail

use, which could potentially impact wildlife, especially caribou winter habitats that are sparsely or non-forested.

Effects from Special Designations

Mount Prindle and Big Windy Hot Springs RNAs are the only specially designated areas. In Alternative A, no camping is allowed in the RNA (though this has not been enforced) to avoid disturbing research projects. This limits human activities in the areas and limits disturbance of Dall sheep, gyrfalcon, and other species.

Management of Birch Creek as a WSR, even though it attracts recreational use, limits impacts to wildlife overall.

4.5.1.7.2. Alternative B

Effects from Wildlife

A wildlife decision (section 2.6.2.1.1.6 Wildlife) to monitor snowmobile use of non-forested caribou habitat, and adjust management if necessary, will reduce potential future impacts should use of these habitats increase. An identified caribou migration corridor (Map 68) is closed to mineral location, entry, and leasing and density of developments will be monitored and limited.

Effects from Leasable Minerals

Only the BLM lands near Circle are open to leasing (44,000 acres). No leasable minerals are expected to be developed in the Steese Subunit due to low potential for occurrence of economically recoverable resources. The RMP will need to be amended before coal could be leased. Leasing of other minerals would require additional NEPA analysis. Seismic exploration for leasable minerals could occur in the areas open to leasing. This is one of two areas (the other being across the Yukon River to the east in the Upper Black River Subunit) where oil and gas leasing is considered most likely to occur during the life of the plan. The entire subunit may be considered for coal inventory and exploration, although none is predicted in the subunit due to small potential (Map 96). Considerable surface disturbance may occur with exploration for coal.

Effects from Locatable Minerals

With the exception of the BLM lands near Circle (44,000 acres), nearly all areas in the subunit are closed to location and entry of new mining claims. Except in the areas near Circle, impacts of mining will be very similar to Alternative A. Exploration for locatable minerals would also occur only on the BLM lands near Circle and on 7,000 acres of valid existing claims. Additional access could be developed to reach existing claims. Little additional mining is expected under this alternative. However, mineral price increases or changes in access could result in greater mining activity.

Effects from Recreation

The Steese SRMA, including most of the BLM lands in the subunit, would have specific management objectives and prescription settings (Map 45). The entire SRMA would be managed as Primitive, Semi-Primitive, or Backcountry. The level of use expected under this management would have very small impacts to wildlife. Most of the area would be in a Primitive classification (1,034,000 acres) and would prohibit summer OHV use (other than use under a subsistence permit). This would largely eliminate potential impacts from recreational motorized vehicle use.

Effects from Travel Management

Almost the entire subunit (except for lands near Circle and Birch Creek) would be managed for recreation settings which do not allow summer OHV use. All areas except RNAs are open for snowmobile use and extensive off-trail use could potentially impact wildlife, especially caribou winter habitats that are sparsely or non-forested. There are wildlife management actions in this alternative which call for monitoring of such use and adjusting management when necessary to minimize impacts to caribou and Dall sheep.

Effects from Special Designations

Designated RNAs are the same as Alternative A and managed similarly. The Steese ACEC boundaries were drawn to include the majority of historical calving habitats of the Fortymile caribou herd, which includes most of the Steese NCA. The large area of historical calving also includes the current calving and postcalving habitats of the White Mountains caribou herd and current postcalving habitats of the Fortymile herd, as well as all Dall sheep habitats in the NCA. Calving and postcalving habitats are considered the most sensitive for the Fortymile herd (Fortymile caribou herd Planning Team 2000). The ACEC is closed to mineral location, entry and leasing and motorized vehicle use will be limited so as to maintain caribou and sheep habitat quality. In this alternative, the entire SRMA is designated as a Primitive, Semi-Primitive, or Backcountry RMZ and, because these RMZs are closed to motorized vehicle use and mineral location, entry and leasing, ACEC designation will have little additional effect. ROPs will apply to other activities permitted by the BLM in the ACEC, which would provide some additional protection to caribou and sheep. This alternative, with or without ACEC designation, will best assure long-term habitat conservation.

Big Windy Creek would be considered suitable for designation as a “wild” river. Management as a “wild” river would differ little from that otherwise proposed in this alternative. However WSR designation would be more permanent than provisions in this plan and would better protect wildlife values along Big Windy Creek (Appendix E, *Wild and Scenic Rivers Inventory*).

4.5.1.7.3. Alternative C

Effects from Wildlife

Same as Alternative B, except that only portions of the caribou migration corridor will be closed to mineral location, entry, and leasing.

Effects from Leasable Minerals

A much larger portion of the subunit (285,000 acres) is open to leasing of minerals under this alternative than Alternative B. Effects from exploration would be similar to those in Alternative B, except that exploration will be more likely to occur in areas that are open to leasing.

Effects from Locatable Minerals

More than half of the BLM lands in the subunit will remain closed to mineral entry (992,000 acres), including the Birch Creek WSR Corridor, an area south of Birch Creek (which includes the Clum's Fork calving area, Dall sheep habitat, and recent caribou calving habitat), and most of the north Steese NCA (which includes the White Mountains caribou calving/postcalving habitat and Dall sheep habitat, and portions of the historical Fortymile calving habitat). A closed

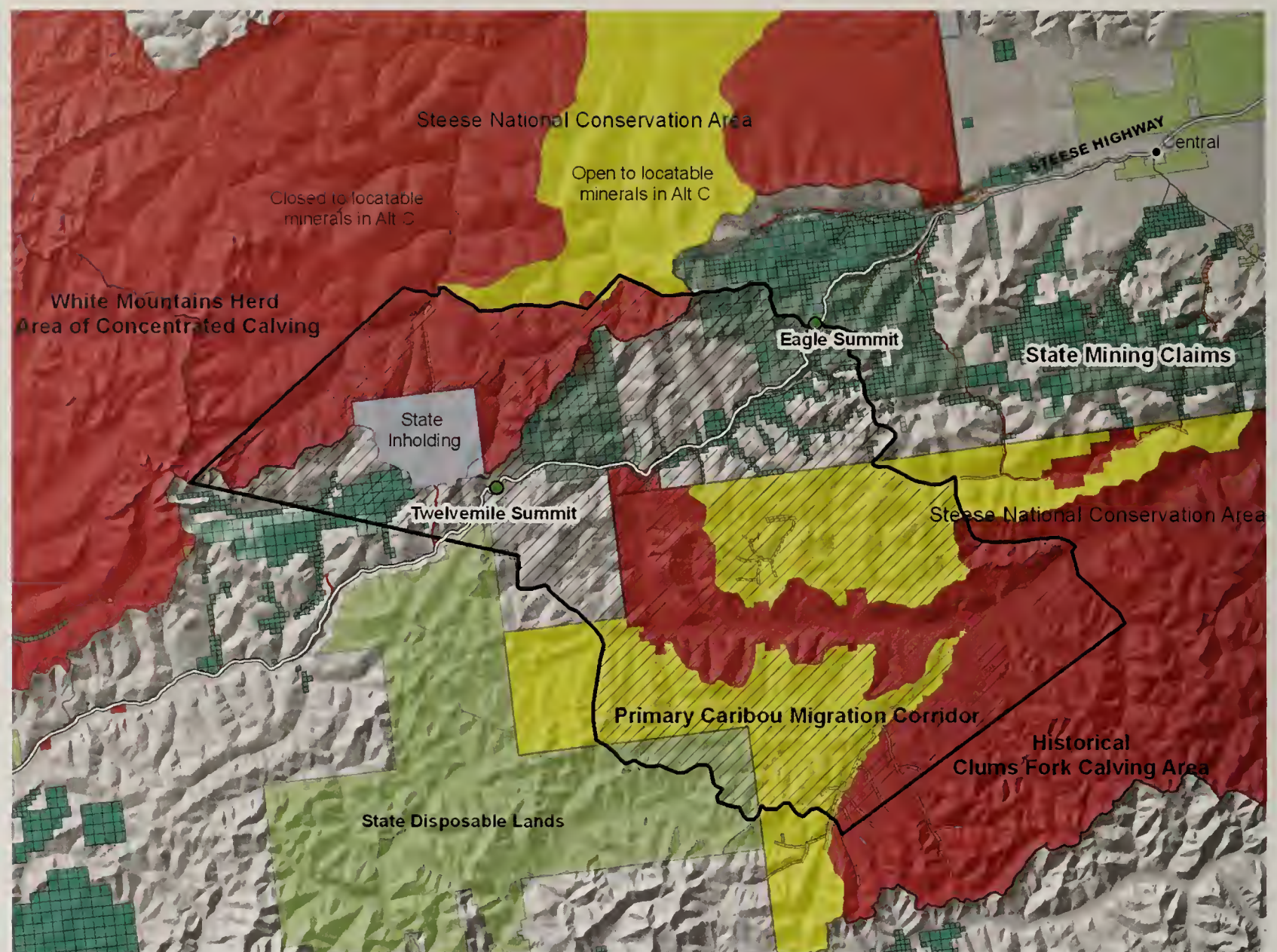
area (Map 33) adjacent to upper Birch Creek WSR Corridor is within the historical Fortymile caribou migration corridor.

All Dall sheep habitat and most current and recent caribou calving/postcalving habitat is closed to mineral location and entry in this alternative, minimizing potential impacts to sheep and caribou. Most identified priority raptor nest sites are within areas closed to mineral entry; ROPs (Appendix A, *Required Operating Procedures and Fluid Mineral Leasing Stipulations*) would apply to open areas and reduce impacts.

Substantial increases in placer mining activity are predicted under this alternative, approximately doubling the number of large and small-scale placer operations from that expected under Alternatives A and B. This will increase the areas of localized disturbance to riparian and aquatic habitats which feature typically long recovery periods (see Fish and Aquatic Species section 4.3.1.4 for more description of impacts to these habitats), and increase the miles of roads and trails needed for access. Roads and trails result in increased off-trail OHV use by recreationists, however summer OHV use will be limited to existing trails in this alternative.

Much of the area historically used by Fortymile caribou to access White Mountains and Preacher Creek calving/postcalving habitat in the White Mountains is open to mineral entry (Figure 4.6, "Caribou Migration Corridor and Minerals Decisions"). Roads, trails, mining operations with high density and levels of activity could potentially reduce the likelihood of future re-establishment of a pattern of migration to those calving habitats, resulting in an effective loss of habitat. A caribou migration corridor has been identified in the wildlife section of this alternative (Map 68) which includes the central, more highly used portion of historical migration habitat (which was also used as calving and postcalving habitat historically). The wildlife decision directs road and trail density in the corridor to be limited to ensure use by caribou for migration. However, the BLM has little control over the density of roads, trails, and mining operations used by miners to develop valid mining claims and no control over what occurs on state and private land within the corridor. The opening of portions of the area to mineral location and entry, could result in a greater density of roads in an already relatively densely roaded area.

Greater than predicted increases in mining activity are possible with the opening of twenty-two percent of subunit (285,000 acres) to mineral location and entry. Dependent on the results of exploration, prices of minerals, and access routes which may be provided by other activities, mining activity can vary substantially and impacts could be considerably greater than anticipated. Possible development of a large lode deposit in the Steese highway vicinity could spur considerable interest and activity in nearby areas of the Steese NCA. Also, the staking of mining claims can result in effects long beyond the life of the plan.



BLM lands open to locatable mineral entry in Alternative C and state mining claims in and near a delineated caribou migration corridor.

Figure 4.6. Caribou Migration Corridor and Minerals Decisions

The opening of new areas to mineral location and entry will likely result in substantial exploration activity. Surface disturbance due to explorations at the Livengood Money Knob lode mine, for example, has involved miles of roads and many drill pads. One such pre-feasibility development operation is predicted, involving 10 acres of disturbance per year for five years and heavy helicopter use to and near the site (12 hr/day flight time). ROPs (Appendix A, *Required Operating Procedures and Fluid Mineral Leasing Stipulations*) concerning activities near priority raptor nest sites will apply in all action alternatives, but not all nest sites of priority raptors are known and few nest sites of other raptors are known. ROPs limit activities in caribou calving/postcalving, but disturbance of caribou may occur outside of the restricted time periods.

Effects from Recreation

More lands are designated as Frontcountry and Middlecountry than in Alternative B, resulting in more facilities and greater recreational use, including motorized use. However, most key wildlife habitats are in Primitive, Semi-Primitive, or Backcountry RMZs, with the exception of much of the caribou migration corridor.

Effects from Travel Management

Summer OHV use will be allowed over most of the subunit and winter OHV use allowed over all of the subunit except RNAs. Summer OHV travel will be limited to a set of existing routes which will greatly reduce impacts and potential impacts to wildlife and wildlife habitat (described in section 4.3.1.12 Impacts Common To All Subunits). In some places, existing trails will be replaced by constructed, sustainable trails or new trails will be constructed in areas with no trails. In contrast to Alternatives A and D, construction of trails will not result in increased cross-country use in the vicinity of the trail. Constructed trails can be routed to minimize impacts to wildlife. The potential for impacts to wildlife from motorized vehicle use will be much reduced in this alternative relative to Alternative A, due to reduced area where they are allowed and restricting of use to existing routes. As in Alternative B, all areas except RNAs are open for snowmobile use and extensive off-trail use could potentially impact wildlife, especially caribou winter habitats that are sparsely or non-forested. There are wildlife management actions in this alternative which call for monitoring of such use and adjusting management when necessary to minimize impacts to caribou and Dall sheep.

Effects from Special Designations

Designated RNAs are the same as Alternative B, but primitive camping is allowed, which may result in slightly greater human activities in the areas and disturbance of Dall sheep, gyrfalcon, and other species.

Relative to Alternative B, this alternative excludes large areas (467,000 acres) of historical Fortymile caribou calving and migration habitat from the ACEC. The Alternative C ACEC includes current White Mountains calving/postcalving habitat, Dall sheep habitat and mineral licks (Preacher Creek and Big Windy/Puzzle Gulch), current Fortymile concentrated calving/postcalving habitats, and the Clum's Fork calving area used by the Fortymile herd in the 1960s and 1970s.

The ACEC in this alternative largely falls within the Rocky Mountain Uplands RMZ (Backcountry) and the Wolf Creek RMZ (Semi-Primitive; Map 66), which do not allow motorized vehicle use and are closed to mineral location, entry, and leasing. ROPs (Appendix A, *Required Operating Procedures and Fluid Mineral Leasing Stipulations*) will apply to other activities permitted by the BLM in the ACEC and provide some additional protection to caribou and sheep. The ACEC overlaps a portion of the Clums RMZ in the Clums Fork drainage and it is only here that the ACEC would result in significant modification of future management. In this area, which has many existing mining claims, the ACEC designation will limit motorized use and not allow additional mining claims or mineral leasing. The Clums Fork calving area was used by Fortymile caribou for at least 16 years in the 1960s and 1970s. In Alternative A this area was identified to remain closed to mineral entry to protect the value of the area as caribou calving habitat. The ACEC designation will maintain the mineral entry closure and also minimize motorized use at a level which will maintain the value of the habitat for caribou.

The exclusion of 467,000 acres of historical calving and migration habitats from the ACEC (relative to Alternative B) could result in somewhat reduced potential for future use of these habitats by Fortymile and White Mountains caribou. The higher levels of recreational activities (especially motorized activities) and mineral development allowed in this area will result in some fragmentation of caribou habitat and avoidance of the vicinity of those activities. The area designated as a "caribou migration corridor" in this alternative, has an objective to limit the density of development in the area to that which will allow the future re-establishment of a pattern of migration to historical calving habitats. However, allowance of mineral location and entry

could restrict the ability of BLM managers to limit development in the corridor, as reasonable access must be granted to mining claim owners.

The ACEC, in addition to Dall sheep habitat and caribou calving/postcalving habitat is also used by caribou during all other seasons. Other wildlife species in the area will benefit as well from management as an ACEC.

Big Windy Hot Springs is not classified as suitable for designation as a “wild” river in this alternative. This will have little effect during the life of the plan, due to other management provisions (e.g., within a Semi-Primitive RMZ and the Steese ACEC), but may provide less protection in the longer term.

4.5.1.7.4. Alternative D

Effects from wildlife

The fewest protections for wildlife, especially caribou, are included in this alternative, negative effects on wildlife will be greatest. No special protection of caribou migration corridor habitats is included.

Effects from Leasable Minerals

A large portion, fifty-four percent of the subunit, is open to leasing of minerals (compared to twenty-two percent in Alternative C). Leasing is not expected anywhere in the subunit and exploration is expected only on the BLM lands near Circle. Some caribou calving/postcalving habitat and Dall sheep habitat, including the area around the Preacher Creek mineral lick, is open to leasing. Most of the caribou migration corridor is open and no special provisions apply to the caribou migration corridor in this alternative. Effects would be similar to Alternative C, except more area, including some sensitive habitats, are open.

Effects from Locatable Minerals

More than half (fifty-four percent; 693,000 acres) of the subunit will be open to mineral location and entry (Map 35). The areas that are closed under Alternative C but open under this alternative include portions of current White Mountains caribou calving/postcalving habitat (and historical Fortymile calving/postcalving/migration habitat) and a Dall sheep mineral lick movement corridor.

Relative to Alternative C, some increases in suction dredging (thirty-three percent) and small-scale placer (sixty percent) operations are predicted under this alternative. Fewer RCAs are designated and many are open to locatable minerals. There will be an increase in the areas of localized disturbance to riparian and aquatic habitats and long recovery periods can be expected (see Fish and Aquatic Species section 4.3.1.4 for more description of impacts to these habitats). Miles of roads and trails needed for access will also increase. Roads and trails result in increased off-trail OHV use by recreationists. In this alternative, cross-country OHV use is allowed in all areas open to mining.

Relative to Alternative C, this alternative will provide less protection to north Steese NCA caribou calving/postcalving habitats and less assurance that migration of Fortymile caribou to these habitats will remain largely unimpeded.

Almost all of the area historically used by Fortymile caribou to access White Mountains and Preacher Creek calving/postcalving habitat in the White Mountains is open to mineral entry. This is a considerable increase in open area relative to Alternative C. Roads, trails, and mining operations with high enough density and levels of activity could potentially reduce the likelihood that the pattern of migration to those calving habitats would in the future be re-established, resulting in loss of habitat. The “caribou migration corridor” management provisions in Alternatives B and C, which direct road and trail density to be limited to ensure use by caribou for migration, are not part of Alternative D. Impacts to caribou calving/postcalving and migration to the White Mountains would be higher than under Alternative C. Use by Dall sheep of the movement route to a mineral lick on Preacher Creek could be impaired by mining or road activity. This route has little to no escape terrain, and so sheep are likely very sensitive to disturbance while using it.

Greater increases in mining activity than predicted are possible with the opening of larger areas to mineral location and entry. Dependent on the results of exploration, prices of minerals, and access routes which may be provided by other activities, mining activity can vary substantially and impacts could be considerably greater than anticipated. Also, the staking of mining claims in a considerably larger area open to staking can result in effects long beyond the life of the plan.

Effects from Recreation

The Rocky Mountain Uplands Backcountry RMZ is reduced in size from that in Alternative C and is similar in size and location to the Primitive Management Unit in Alternative A (Maps 45, 46 and 47). The allowance of cross-country OHV use will compound the impacts in areas where OHVs would be allowed (Middlecountry and Frontcountry RMZs). Caribou use of calving/postcalving, summer, and migration habitats and Dall sheep use of a mineral lick (in the Preacher Creek RMZ) could potentially be affected by allowed cross-country OHV use, if that level of use increases.

Effects from Travel Management

Potential for impacts to wildlife from summer OHV use are greater than Alternative C due to increased area in which they are allowed and the allowance of cross-country OHV use. Impacts are very similar to Alternative A. Alternative D includes the large Wolf Creek Backcountry RMZ (Map 56), which is closed to summer OHV use, while Alternative A allows such use in that area; however the area is essentially inaccessible. All areas except RNAs are open for snowmobile use and extensive off-trail use could potentially impact wildlife, especially caribou winter habitats that are sparsely or non-forested. No specific management provisions for monitoring of excessive off-trail use and making management changes are included in this alternative.

Effects from Special Designations

The effects from RNAs are the same as Alternative C.

The Steese ACEC includes only Dall sheep mineral licks, core calving habitats of the White Mountains caribou herd, the recently used Clums Fork calving area (Fortymile herd) and the current concentrated calving/postcalving range of the Fortymile herd (193,000 acres). These areas will be closed to mineral entry, location, and leasing.

In most of the remainder of the subunit, mineral location, entry, and leasing are allowed. However, much of Fortymile historical calving range and Dall sheep habitat south of Birch Creek occurs in the Wolf Creek (Semi-Primitive) RMZ, which is closed to mineral location, entry, and

leasing. Important wildlife habitats open to mineral location, entry and leasing in Alternative D include a movement corridor to the Preacher Creek Dall sheep mineral lick, historical Fortymile calving/postcalving habitat in both north and south Steese NCA, current White Mountains caribou calving/postcalving habitat in the north Steese NCA, and caribou migration habitats. These areas outside the ACEC and open to mineral entry, location, and leasing are also to be managed as Frontcountry and Middlecountry RMZs and summer cross-country OHV use will be allowed. Although activities in these areas are currently not heavy, the combined effects of opening them to mineral location, entry, and leasing and allowance of unrestricted summer OHV use may result in degradation of wildlife habitat in these areas, including reduced use of the Preacher Creek Mineral lick by Dall sheep, reduced likelihood of reestablishing migration to White Mountains calving range by the Fortymile Herd, and reduced calving habitat quality in these areas.

Effects from Wild and Scenic Rivers designation and management are the same as Alternative C.

4.5.1.7.5. Cumulative Impacts

Cumulative impacts will accrue from BLM management decisions in addition to activities on surrounding lands during and beyond the life of the plan. Cumulative impacts to caribou in Alternatives C and D may potentially be substantial if development reduces the potential for Fortymile caribou to use the historical migration corridor and therefore calving habitats in the north Steese NCA and White Mountains NRA. There are indications that re-establishment of a pattern of use of the White Mountains NRA and portions of the north Steese NCA by caribou during calving and summer may be necessary for the Fortymile herd to continue to grow without a decline in nutritional condition. Re-establishing this migratory pattern may be less likely if levels of surface disturbance and human activity are high. This could result from combinations of increased recreational use of the area, increased use of the Steese Highway, high levels of mineral development, and disposal of state lands with associated private land development.

More than one third of the delineated migration corridor is comprised of state land that lies on both sides of the Steese Highway and between the north and south units of the Steese NCA (Figure 4.6, “Caribou Migration Corridor and Minerals Decisions”). More than a quarter of the state lands currently open to mining claims in this corridor were staked (mostly as lode claims) as of May 2011. Adjacent areas of the Steese NCA will also be open to both locatable and leasable minerals in Alternatives C and D. Development of minerals in the Steese NCA could add cumulative impacts to those occurring as a result of mineral and other development on adjacent state lands in and near the identified corridor. The total area open for mineral development ranges from thirty-four percent of the corridor in Alternative B (where no BLM lands except existing claims are open for mineral development) to fifty-nine percent in Alternative C and eighty percent in Alternative D. Even though the *Reasonably Foreseeable Development* scenario predicted fairly low levels of additional mining activity in the Steese NCA under all Alternatives, most of that activity is likely to occur within or near the migration corridor. In addition, impacts beyond the life of the RMP from opening to mineral location and entry could occur because large mines take many years to get started and because mining claims can be maintained indefinitely. Once opened to mineral location and entry, future management options become limited. After mining claims are validly staked, it may be difficult for BLM or the State to manage the area for a level of disturbance which does not reduce caribou use. See also section 4.3.1.12 Impacts Common to All Subunits.

4.5.2. Resource Uses

4.5.2.1. Locatable Minerals Steese Subunit

Summary of Effects

Alternative A would not open up any new lands for locatable minerals. Future exploration and development would be limited to existing claims. As claims are lost, new claims could not be restaked and mining activity would decrease over time. Alternatives B, C, and D would open up additional land to locatable mineral entry, ranging from 45,000 acres in Alternative B to 693,000 acres (fifty-five percent of the subunit) in Alternative D. Certain lands remain closed throughout all the alternatives: Birch Creek WSR Corridor, Mount Prindle and Big Windy Hot Springs RNAs, Wolf Creek RMZ, Pinnell Mountain Trail RMZ, Rocky Mountains Uplands RMZ, Steese ACEC, disposal lands, and the BLM's Central Administrative Site. Alternative D would open the Bachelor and Preacher Creek drainages to locatable minerals. This area has mineral potential as well as reasonable access. The drainages would be constrained by RCAs in Alternatives B and C.

4.5.2.1.1. Effects Common to All Alternatives

State- and Native-selected lands would remain segregated from mineral entry and location until final land title has been established. New mining operations on withdrawn lands would require a validity exam prior to approval of a Plan of Operation. All active mining operations would be required to submit a Plan of Operation if the 1,000 ton bulk sample is exceeded (3809.11(b)) or if cyanide is used in the processing of amenable ores. Mining claim surface occupancy is guaranteed, but must remain reasonably incident to the current levels of mining activity. Bonding is required of all mining operations other than those grandfathered under 43 CFR 3809.300 and 43 CFR 3809.400. Reclamation of surface disturbance would be required. Undue and unnecessary degradation would remain the standard for mining operations on BLM lands. The right of reasonable access across BLM lands to unpatented federal mining claims is assured. Cultural resources encountered during surface-disturbing activities are subject to the Antiquities Act (43 CFR 3809.420(b)(8)).

Riparian Conservation Areas (RCAs) are being instituted on drainages that have been identified for the protection of fish resources. The RCAs would act as an discretionary closure to locatable minerals. It is anticipated that stream buffer widths would generally range from 25 to 200 feet in size depending on site-specific factors. The RCAs would restrict placer mining within the creek and the riparian buffer. However, suction dredging would be allowed. Placer mining could occur on the bench outside the buffer if a discovery were made. A small channel could be authorized to facilitate drainage through the buffer back to the active stream channel. However, it would still be cost prohibitive to operate with obstacles preventing free access to water. Additionally, the gold (or other commodity) recovery from a bench claim would not necessarily be equivalent to what is available in the stream from prospecting. It would also be more difficult to make the initial discovery. Mining would entail a bigger risk, which may be too much for an operator to assume, in which case they would go elsewhere.

RCAs would result in a significant restriction on locatable mineral exploration and development. The BLM would conduct an analysis and determine the minimum buffer width needed. However, free access to the stream would not be available and operators would have to rely on pumping water to bench operations. This additional cost for doing business would turn many prospective

operators away, and recovery of minerals within RCAs would not be available for the benefit for society.

4.5.2.1.2. Alternative A (No Action)

Under Alternative A, no withdrawal review would occur and ANCSA 17(d)(1) withdrawals would not be revoked. The BLM would continue to administer new and existing operations on federal unpatented mining claims through Notices or Plans of Operations. However, the potential for future exploration and development would be limited to 7,000 acres of existing mining claims. Overall mining activity would decrease as there would be no opportunity to stake new federal mining claims to offset the claims that disappear. This alternative would offer no process to address existing withdrawals.

4.5.2.1.3. Alternative B

Under Alternative B, 1,231,000 acres in the Steese Subunit would be closed to locatable mineral entry (Map 31), including the Steese NCA, the Birch Creek WSR, disposal lands, and BLM's Central Administrative Site. There would be 21 RCAs, all of which would be in the closed areas. The lands closed to mineral entry include high mineral potential areas. The minerals in these closed areas would not be available for the benefit of society.

The remaining 45,000 acres in the subunit would be available to mineral location. The open lands would include low mineral potential lands near Circle. New claims could be staked on tributaries to Birch Creek or the Yukon River, but would be limited to small-scale operations due to the limited resource potential. This alternative would provide more opportunities than Alternative A, but would still greatly limit mining opportunity.

4.5.2.1.4. Alternative C

Under Alternative C, 992,000 acres in the Steese Subunit would be closed to locatable mineral entry (Map 33), including portions of the Steese NCA, the Birch Creek WSR, disposal lands, and BLM's Central Administrative Site.

There would be 18 RCAs, a portion of which are within closed areas. Other RCAs close additional acreage, specifically within the Preacher and Bachelor Creek drainages (including tributaries). These streams are considered high potential for locatable minerals and have road access. The RCAs would restrict placer mining within the creeks and the riparian buffers as described in section 4.5.2.1.1 Effects Common to All Alternatives.

Preacher and Bachelor creeks would likely draw mining interest, but RCA buffers would likely deter any serious mineral recovery from these streams. Mineral recovery by suction dredging would not have the same recovery as a placer mine. The minerals located within RCA buffers, or other areas that would be closed under this alternative, would not be available for the benefit of society. Those minerals would be unrecoverable for the foreseeable future.

Approximately 285,000 acres, or twenty percent of the Steese Subunit, would be available to mineral location under Alternative C, including high mineral potential lands within the northern and western portion of the South Steese NCA Unit. These areas contain roads and trails which facilitate access. Having available access into these high potential lands would account for the majority of the anticipated 18 small-scale placer operations and nine suction dredge operations.

4.5.2.1.5. Alternative D

Under Alternative D, 583,000 acres (forty-six percent of the Steese Subunit) would be closed to locatable mineral entry, including portions of the Steese NCA, the Birch Creek WSR, disposal lands, and the BLM's Central Administrative Site (Map 35). There would be eight RCAs under this alternative, a portion of which are within closed areas. The RCAs would restrict placer mining within the creeks and the riparian buffers as described under 4.5.2.1.1., Effects Common to All Alternatives. These minerals and their benefits to society would remain unavailable for the foreseeable future.

The remaining 693,000 acres (fifty-four percent) of the subunit would be open to locatable minerals, including Bachelor and Preacher creeks. These accessible and high mineral potential lands would account for the majority of the 24 anticipated small-scale placers and 12 suction dredge operations.

4.5.2.1.6. Cumulative Impacts

Impacts to locatable minerals that are individually minor may cumulatively reduce exploration and production of commodities from public lands. Factors that affect mineral extraction and prospecting include, but are not limited to, such things as permitting and permitting delays, regulatory policy, public perception and concerns, travel management, transportation, mitigation measures, proximity to sensitive areas (such as ACECs, RCAs), low commodity prices, taxes, and housing and other necessities for workers. Many of these issues are issues over which the BLM has no control. Most of these issues result in additional costs and/or permitting delays that can individually or cumulatively impact projects.

Public lands that currently have no access could reduce the amount of mineral exploration and development that may occur. Mineral resources on non-BLM lands may not be developed if the adjacent public lands are withdrawn from mineral entry because it may not be economical to develop if only a portion of the deposit is available.

Alternative B in the Steese Subunit would be the most restrictive action alternative to mineral development and would result in the greatest cumulative impacts. It proposes the most acres closed to mineral entry, the most areas limited or closed to motorized travel, and the highest protection to other resources. Alternative D would have the least cumulative impact to locatable minerals.

4.5.2.2. Recreation Steese Subunit

Summary of Effects

The proposed alternatives would result in a wide range of possible recreation experiences and activities. Proper resource management, including site-specific measures to protect healthy, functioning watersheds, riparian areas, and associated fish and wildlife habitats, would result in short- and long-term, beneficial impacts to fish and wildlife related recreation. Special designations and management of areas, including ACECs and WSRs, would further protect areas within the subunit, potentially increasing wildlife populations that benefit wildlife viewing, hunting, and fishing opportunities as well as other values such as scenic, geologic and historic which enhance recreational experiences.

Proposed management in ACECs and WSRs would encourage recreation activities of a more non-motorized, Semi-Primitive nature. As the size and scope of these special designations change, opportunities for non-motorized forms of recreation would also change. Proposed management in ACECs and WSRs would impact recreation negatively, if additional restrictions were placed on OHV use or other recreational activities.

The delineation of a SRMA and subsequent Recreation Management Zones, within the Steese NCA and Birch Creek WSR would protect and enhance recreational resources providing a range of opportunities while encouraging specific targeted outcomes in these areas. Land, and water activities would continue to remain the focus in these designations, including the commonly conducted activities of boating and river based recreation, camping, fishing, hunting, hiking and backpacking, gathering of edible plants and berries, OHV use (both summer and winter), skiing, dogmushing, and other forms of recreation.

Alternative B emphasizes less motorized recreation use in a more primitive setting with experiences of solitude, escape from crowds and enjoying the smells and sounds of nature in a natural landscape. Alternative C provides for multiple recreation opportunities and experiences, while sustaining the recreation-resource base and other sensitive resource values of the subunit. Experiences available for both motorized and non-motorized users include escape from crowds, experiencing nature, and enjoying the smells and sounds of nature in a naturally appearing landscape. Alternative D offers more motorized recreation use and includes the most acreage for cross-country OHV travel. Experiences available for motorized users include experiencing a naturally appearing landscape in a more developed setting with family or friends groups.

Table 4.12. Comparison of Recreation Indicators Steese Subunit

Indicator	Alternatives					
	B (acres)		C (acres)		D (acres)	
Special Recreation Management Area	1,246,000		1,246,000		1,246,000	
other BLM lands	45,000		45,000		45,000	
Recreation Opportunity Spectrum Class (acres)						
ROS Class	Steese NCA	SRMA	Steese NCA	SRMA	Steese NCA	SRMA
Primitive	1,035,000	1,035,000	3,000	3,000	3,000	3,000
Semi-Primitive	0	87,000	436,000	87,000	16,000	87,000
Backcountry	124,000	124,000	154,000	154,000	407,000	407,000
Middlecountry	0	0	452,000	452,000	608,000	609,000
Frontcountry	0	0	114,000	114,000	124,000	124,000

Semi-Primitive lands within the SRMA but outside the Steese NCA are lands associated with Birch Creek WSR Corridor and the Birch Creek RMZ.

4.5.2.2.1. Alternative A (No Action)

Under continued management, recreation resources would be managed according to the recreation opportunity spectrum settings (ROS) and on an activity basis with consideration for identifying and meeting recreation experiences. Recreation opportunity spectrum settings are identified as Primitive and Semi-Primitive with little facility development. User groups tend to be small, however, there are no identified target group sizes. The major experiences and benefits managed for include escape personal pressures and crowds, experiencing nature and solitude, and enjoyment of nature. Motorized use is allowed throughout most of the Steese NCA and on

all other lands within the subunit. The NCA, inclusive of Birch Creek WSR Corridor, is being managed as an SRMA. Birch Creek WSR is not considered part of the Steese NCA.

Effects from Fish and Aquatic Species

Management activities to protect fish habitat along tributaries of Birch Creek WSR including South Fork and its tributaries, Clums Fork, Sheep Creek, and Harrington Fork, will generally protect resources by restricting surface-disturbing activities. The use of special stipulations to protect crucial habitats may impact recreation by limiting or restricting development and use of these areas.

Effects from Visual Resources

Managing visual resources is an important aspect for recreation resources and experiences of naturalness. Maintaining the natural setting is a key component in each recreation management unit. The VRM classes protect the recreation opportunities for Primitive and Semi-Primitive RMZs.

The Birch Creek WSR Corridor (69,000 acres), which is not included in the Steese NCA, is assigned VRM Class I with the objective to preserve the existing character of the landscape yet allow very limited management activities. The level of change to the characteristic landscape should be very low and must not attract attention of a casual observer. This objective allows for facilities development in protection of resources while maintaining the naturalness of the unit and protecting the experience of naturalness and the closeness of nature in a natural landscape.

The Primitive Management Unit (inclusive of Mount Prindle RNA) is assigned a VRM Class II with the objective to retain the existing character of the landscape where the level of change to the characteristic landscape should be low and management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape. This allows for some facilities development and users to enjoy the natural sights and sounds of nature in a naturally appearing landscape. Approximately 64,000 acres are managed as VRM Class II.

The Semi-Primitive Management Units (inclusive of Big Windy RNA) are assigned a VRM Class III with an objective to partially retain the existing character of the landscape, where the level of change to the characteristic landscape can be moderate and management activities may attract the attention but should not dominate the view of the casual observer. Changes should repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape. This allows for some facilities development and users to enjoy the natural sights and sounds of nature in a naturally appearing landscape. Approximately 1,075,000 acres would be managed as VRM Class III.

VRM Classes are not assigned on the remaining lands (64,000 acres) outside the Steese NCA and Birch Creek WSR Corridor. Effects on visual resources are evaluated and mitigated on a project-specific basis.

Effects from Wildlife

Wildlife goals of protecting and enhancing wildlife populations and crucial habitat areas within the Steese NCA would continue to impact recreation. Healthy wildlife populations would benefit wildlife viewing, hunting and trapping activities and experiences of a closeness to nature

enhanced by observing wildlife. The biggest impacts to recreation from wildlife management would be in limiting potential motorized and non-motorized recreational opportunities.

Effects from Forest and Woodland Products

Under Alternative A, personal use of timber is allowed within the Steese NCA and Birch Creek WSR Corridor (1,211,000 acres), but commercial use of timber is not. Little to no personal use of forest and woodland products has occurred within this area to date. Impacts would depend on the location, size of the area and harvest techniques used but, are assumed to be limited since personal use harvest is limited to small volumes of timber.

Effects from Land and Realty

Land use authorizations within the Steese NCA such as leases and rights-of-way could indirectly and directly impact recreation resources and experiences of naturalness and escape from crowds and pressures of life, if leases or rights-of-ways were allowed in Primitive or Semi-Primitive Management Units.

Under Alternative A, four transportation corridors have been identified within the Steese NCA. To the extent possible, rights-of-way would be limited to these corridors. The use of corridors to concentrate use would impact the recreational opportunity in the management units they are located in, but could enhance recreational opportunity in areas where no corridors exist and rights-of-way would be less likely to be authorized.

Both the Montana-Preacher Creek and the Loper Creek transportation corridors are located within a Semi-Primitive Management Unit in the North Steese NCA. These corridors would impact the naturalness of the area if developments were approved in the corridor. However, they could also provide access to some remote areas enhancing recreation opportunities by making more areas available for primitive type recreational experiences of solitude and escape from crowds. These corridors could impact up to 20,000 acres of the Semi-Primitive Management Unit, however impacts would be minimal because the Steese NCA would remain closed to new mineral entry, and subsequent development and other rights-of-ways would be unlikely.

Both the Great Unknown Creek and the Portage Creek-Buckly Bar transportation corridors are located in the South Steese NCA Unit, within the Semi-Primitive Management Unit. Both also cross Birch Creek WSR Corridor. These transportation corridors would impact the naturalness of the area if rights-of-way were authorized in the corridor. However, they could also provide access to some remote areas enhancing recreation opportunities by making more areas available for primitive type recreational experiences of solitude and escape from crowds. These corridors could impact up to 33,000 acres of the Semi-Primitive Unit, however impacts would be minimal because the Steese NCA would remain closed to new mineral entry and subsequent development and other rights-of-ways would be unlikely.

Effects from Minerals

Maintaining the closure to mineral entry and leasing on all lands within the subunit, including lands within the Steese NCA and Birch Creek WSR Corridor (1,206,000 acres) would protect recreation resources and experiences of naturalness and escape from crowds by not allowing surface-disturbing activities related to mineral development.

Salable minerals such as sand and gravel would continue to be considered throughout the subunit and may impact recreation activities and experiences. Impacts would depend on the location,

size and methods of mineral extraction. No known salable materials have been mined within the Steese NCA or Birch Creek WSR Corridor.

Effects from Recreation

The Steese NCA and Birch Creek WSR Corridor would continue to be managed for recreation opportunities and experiences based on the recreation opportunity spectrum and managed as an SRMA but without niche decisions, management objective decisions, primary targeted outcomes, setting character decisions, and implementation framework decision. Management actions would continue to provide for multiple recreation activities within two recreation opportunity spectrum units: 64,000 acres would be managed as Primitive, 1,075,000 acres would be managed as Semi-Primitive. Birch Creek WSR Corridor would continue to be managed as a Primitive area with winter motorized use. Facilities would continue to be built to protect resources and provide for enhancement of activities and experiences.

Lands outside the Steese NCA and Birch Creek WSR Corridor (69,000 acres) would continue to be managed for custodial actions only to reduce conflicts and protect health and safety of users. No facilities would be constructed for user comforts to enhance activities or experiences.

Effects from Travel Management

The RNAs and the Pinnell Mountain Trail are closed to all motorized use. The Primitive Management Unit (64,000 acres) in the Steese NCA is closed to summer OHV use, but allows for use of snowmobiles and aircraft. These management prescriptions would limit recreational opportunities but also enhance non-motorized experiences associated with Primitive areas, such as experiences of self-reliance, naturalness and closeness to nature and escape from crowds. These restrictions would negatively impact activities such as hunting and trapping that depend on motorized vehicles for access, and activities that benefit from motorized use such as cross-country skiing and dogmushing where vehicles are used to set trails or tracks.

The travel management prescription for the Semi-Primitive Management Unit in the Steese NCA (1,075,000 acres) allows summer and winter use of vehicles of 1,500 pounds GVWR and less and use of aircraft. User conflicts may occur and cross-country use with this size of vehicle could impact naturalness.

The Travel management prescription for Birch Creek WSR Corridor (69,000 acres) allows cross-country winter use of snowmobiles of 1,500 pounds GVWR and less and use of aircraft. It is closed to hovercraft and airboats. Recreation users may experience conflicts between different user groups.

In all management units of the Steese NCA and in Birch Creek WSR Corridor, a permit or approved plan of operation is required for any type of motorized use that exceeds the travel management prescriptions. Impacts would depend of the size of vehicle, season of travel and area of travel. If permitted, these activities could impact naturalness and solitude for users, or create conflicts between different user groups.

Outside the Steese NCA and Birch Creek WSR Corridor (64,000 acres), there are no OHV designations. Thus all forms of motorized travel are allowed. Recreation users may experience conflicts between different user groups.

Effects from Special Designations

The management of Big Windy and Mount Prindle RNAs (3,000 acres) within the Steese NCA would continue to protect the natural process and type needs identified for each RNA and would protect recreation resources and experiences of naturalness as well as provide for hiking, climbing, hunting and the enjoyment of an undeveloped hot springs in a Primitive setting (Map 44). Some minor trail development may occur.

Birch Creek WSR (69,000 acres) would continue to be managed by the approved River Management Plan to protect and enhance the values for which it was set aside, free-flowing characteristics and water quality. Continued management would continue to enhance recreation use of the river for high quality multi-day road accessible primitive recreational float-boat experience for the experienced canoeist.

4.5.2.2.2. Alternative B

Alternative B anticipates the lowest level of resource development. Recreation experiences trend towards those dependent on undeveloped to moderately developed activities with small user groups in a natural landscape. The major experiences and benefits managed for include escape personal pressures and crowds, experiencing nature and solitude, and exploration of nature. The ROS ranges from Primitive to Backcountry.

Effects from Fish and Aquatic Species

Impacts to recreation resources by measures to protect and/or restore healthy, functioning watersheds, riparian areas, and associated fish habitats in 21 Riparian Conservation Areas (RCAs) and three High Priority Restoration Watersheds could impact recreation by requiring reclamation through active revegetation and streambank stabilization within three years for all surface-disturbing activities associated with mining. This would enhance the naturalness of previously disturbed areas. Recreation facilities would need to be designed and constructed to meet the Desired Future Conditions for aquatic habitats. Obliteration of recreation facilities would need to include reclamation of disturbed areas using appropriate active revegetation and streambank stabilization techniques. Development of recreation facilities such as trailheads and trails would most likely only impact five acres per developed area. Portions of 17 of the RCAs and portions of all three Restoration Watersheds are within the Steese NCA.

Effects from Visual Resources

Managing visual resources is an important aspect for recreation resources and experiences of naturalness. Maintaining the natural setting is a key component in every recreation opportunity setting description. Under Alternative B, VRM decisions would protect the recreation experience for both the Primitive RMZs within the Steese NCA and the Semi-Primitive Birch Creek RMZ.

The Birch Creek RMZ, Pinnell Mountain Trail RMZ, and the RNAs would be assigned VRM Class I, with the objective to preserve the existing character of the landscape yet allow very limited management activities. The level of change to the landscape should be very low and must not attract attention of a casual observer. This objective will allow for facilities development in protection of resources, while maintaining the naturalness and protecting the experience of naturalness and the closeness of nature in a natural landscape. Approximately 106,000 acres would be managed as VRM Class I, including 87,000 acres outside the Steese NCA.

The Backcountry RMZs and remaining Primitive RMZs, would be assigned a VRM Class II with an objective to retain the existing character of the landscape where the level of change to the

characteristic landscape should be low and management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape. This will allow for some facilities development and small groups to enjoy the natural sights and sounds of nature in a naturally appearing landscape. Approximately 1,139,000 acres within the Steese NCA would be managed as VRM Class II.

Visual Resource Management Class IV would be assigned to other BLM lands (45,000 acres) where the objective is to allow for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt would be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements. Recreation activities based on elements of solitude and experiences of naturalness would be impacted by development of these lands from medium to large surface-disturbing activities if seen from the Foreground-Middleground Zone or from an elevated location.

Effects from Wilderness Characteristics

The maintenance of wilderness characteristics on 1,199,000 acres would directly protect the Primitive RMZs (within the Steese NCA) and the Semi-Primitive Birch Creek RMZ where naturalness and solitude enhance the experiences and enjoyment of the sights and sounds of nature and closeness to the natural environment, and the experiences of escaping from crowds and the pressures of daily life. All of the 1,035,000 acres identified as Primitive are also identified for maintenance of wilderness characteristics (Map 77). Of the 87,000 acres identified as Semi-Primitive, 84,000 acres are also identified for maintenance of wilderness characteristics.

No areas with wilderness characteristics were identified on other BLM lands.

Effects from Wildlife

Wildlife goals of protecting and enhancing wildlife populations and crucial habitat areas within the Steese NCA would continue to impact recreation. Healthy wildlife populations would benefit wildlife viewing, hunting and trapping activities and experiences of a closeness to nature enhanced by observing wildlife.

Avoidance areas and other restrictions could impact recreational development including possible seasonal or timing closures, location, and limiting the extent of activities or development. Wildlife concerns could make projects more costly, more difficult to accomplish, or projects may not meet recreation objectives after restrictions are applied. The biggest impacts to recreation from wildlife would be in limiting potential motorized and non-motorized recreational opportunities.

The prohibition on the use of domestic goats, sheep and camelids in Dall sheep habitat could impact recreation use by users seeking to use these animals as pack animals as part of their recreation experience. It is anticipated that this is a small user group but interest has been growing in the lower 48 states.

Effects from Forest and Woodland Products

Under Alternative B, personal use of timber, timber salvage sales, commercial sales, and commercial use of forest products would not be allowed within the Steese SRMA (1,246,000 acres of which 1,142,000 acres are in the Steese NCA). These management actions would help

protect recreation resources and experiences of naturalness and closeness to nature. It is assumed that the use of forest and woodland products would be low within the Steese SRMA (Map 45). Effects under Alternative B would be similar to or lower than under Alternative A.

Personal use of timber under free-use permits, timber salvage sales, commercial sales, and commercial use of forest products would be allowed within other BLM lands (45,000 acres) where impacts to recreation experiences and opportunities would depend on the size of the area and harvest techniques used. It is assumed that the use of forest and woodland products would be low on other BLM lands within the subunit.

Effects from Land and Realty

Land use authorizations such as leases and rights-of-way could indirectly and directly impact recreation resources and experiences of naturalness and escape from crowds and pressures of life, if leases or rights-of-ways were allowed in Primitive, Semi-Primitive and Backcountry recreational opportunity spectrum settings.

Under Alternative B, two transportation corridors within the Steese NCA, have been identified. To the extent possible, all rights-of-way would be within one of these corridors. The use of corridors to concentrate use would impact the recreational opportunity spectrum settings they are located in, but could enhance other recreational opportunity spectrum settings where no corridors exist and rights-of-way would be less likely to be authorized.

The Montana-Preacher Creek transportation corridor is located within the Preacher Creek RMZ which has a Primitive recreation setting. This corridor would impact the naturalness of the area if rights-of-ways within the corridor were developed. However, it could also provide access to some remote areas enhancing recreation opportunities by making more areas available for primitive type recreational experiences of solitude and escape from crowds. This corridor could impact up to 12,000 acres of the Preacher Creek RMZ, however impacts would be minimal because the Steese SRMA would remain closed to mineral entry and subsequent development and other rights-of-ways would be unlikely.

The Great Unknown Creek transportation corridor is located in the Harrison RMZ with a Backcountry recreation setting, Birch Creek RMZ with a Semi-Primitive setting, and the Wolf Creek RMZ with a Primitive setting. The Backcountry Zone allows for development of facilities as long as they blend with the surrounding landscape. Allowing development within this zone would enhance recreation experiences by providing access. Development of facilities within Semi-Primitive Zone would impact the naturalness of the area, but could be allowed if they are designed to blend with the surrounding landscape. Development of facilities within the Primitive Zone would impact the naturalness of the area; however it could also provide access to remote areas enhancing recreation opportunities by making areas available for primitive type recreation experiences of solitude, escape from crowds and pressures of life, and small groups of generally three or less. This corridor could impact approximately 12,000 acres of the Backcountry Harrison Creek RMZ, 3,000 acres of the Birch Creek RMZ and 3,000 acres of the Primitive Wolf Creek RMZ, however impacts would be low because the Steese SRMA would remain closed to mineral entry and subsequent development and few rights-of-ways are anticipated in these areas.

Identifying the Steese ACEC and the Research Natural Areas, both within the Steese NCA, and Birch Creek WSR Corridor (except in the identified transportation corridor) as right-of-way avoidance areas would protect recreation resources and experiences of naturalness on

approximately 1,182,000 acres within the Preacher Creek and Wolf Creek Primitive RMZs, Birch Creek Semi-Primitive RMZ and Harrison Backcountry RMZ.

Maintaining the ANILCA withdrawal from locatable mineral entry for the Steese NCA would enhance the naturalness experience in the all RMZs by not allowing surface disturbance activities associated with mineral development on 1,246,000 acres.

Portions of Birch Creek, Pinnell Mountain and Preacher Creek RMZs would be closed to locatable minerals (18,000 acres). These lands are outside the Steese NCA and Birch Creek WSR Corridor but are adjacent to these units and the closer would enhance the naturalness experience by not allowing surface disturbance activities associated with mineral development.

Effects from Minerals

Closing the entire Steese SRMA (1,245,000 acres) to leasable minerals, locatable minerals and salable minerals would protect recreation resources and experiences of naturalness and escape from crowds by not allowing surface-disturbing activities related to mineral development. Seismic exploration activities could impact recreation by improving winter access through the clearing of seismic lines. Impacts to naturalness could occur through the clearing of lines for both summer and winter recreation and the experience of escape from crowds would be impacted during seismic operations.

Valid existing mining claims located within Primitive and Backcountry recreational opportunity spectrum setting classes, both within the Steese NCA, would impact the naturalness of the area and the experience of escape from crowds. Continued mining on 5,000 acres of existing claims would impact recreation under this alternative.

Other BLM lands would be open to fluid and solid mineral leasing, locatable and salable minerals impacting recreation activities by development activities enhancing access but also causing surface disturbance in otherwise natural areas.

Effects from Recreation

Management actions would provide for multiple recreation activities within three recreation opportunity spectrum settings. 1,035,000 acres would be managed as Primitive in the Preacher Creek, Wolf Creek, Mount Prindle RNA, Big Windy RNA, and Pinnell Mountain RMZs, all within the Steese NCA. 87,000 acres would be managed as Semi-Primitive in the Birch Creek RMZ while 124,000 acres would be managed as Backcountry in the Harrison RMZ (within the Steese NCA).

At eighty-three percent the Primitive RMZ accounts for the largest setting, while Semi-Primitive accounts for seven percent (Birch Creek WSR) and the Backcountry RMZ accounts for ten percent. These percentages are indicative of the management emphasis for recreation activities on BLM-managed lands within the subunit and the Steese NCA. Much of the SRMA would be managed for the primitive experiences, minimal facilities development for resource protection and small user groups generally of less than three persons. These settings would protect and enhance the experiences of naturalness, escape from crowds and solitude. Semi-Primitive areas would be managed for winter motorized use, rustic and rudimentary facilities development generally constructed using natural materials, and designed to blend with surrounding landscape and small user groups generally of four or fewer persons. Backcountry experiences of motorized use, with small facilities development (approximately three acres for each site developed)

generally constructed using naturally appearing materials, and designed to blend with surrounding landscape to support user groups of up to seven people average.

Other BLM lands would not be managed under a recreation opportunity spectrum setting and would not be managed for an identified range of experiences or activities.

Effects from Travel Management

The Primitive Zones of Preacher Creek, Wolf Creek, and Pinnell Mountain RMZs (all within the Steese NCA) would be open to non-motorized travel, winter snowmobile travel and aircraft landings without clearing of vegetation, limiting recreational opportunities but enhancing self-reliance, naturalness and closeness to nature and escape from crowds. The RNAs (Mount Prindle RNA, Big Windy RNA) would be managed for non-motorized travel. A permit or approved plan of operation for all forms of OHV (including clearing of vegetation for aircraft landings) use would be required in the Primitive Zones. If permitted, these activities could impact naturalness and solitude for users and the impacts would depend on the size of vehicle, route and season of travel. Closure of 1,034,000 acres (eighty-three percent of the SRMA) to summer OHV use would negatively impact activities such as hunting and trapping that depend on motorized vehicles for access.

The Semi-Primitive Birch Creek RMZ (87,000 acres) and the Backcountry Harrison RMZ (124,000 acres) within the Steese NCA, would be open to winter use of snowmobiles of 1,000 pounds curb weight and less, limiting recreational opportunities to non-motorized summer OHV access while allowing aircraft landing and motorboats and winter motorized use. Recreation experiences include self-reliance, naturalness and closeness to nature and escape from crowds with minimal facilities. The closure of these areas to summer OHV use would negatively impact motorized assisted activities such as hunting. Aircraft use would be unrestricted and this may directly and indirectly impact naturalness and solitude for users. A permit or approved plan of operation would be required for all other forms of OHV use. If permitted, these activities could impact naturalness and solitude for users. Effects would depend on the size of vehicle, route and season of travel.

Within the Birch Creek WSR Corridor and the Steese NCA, the use of hovercraft, airboats and personal water craft would not be allowed on BLM determined non-navigable section within the Steese NCA.

Other BLM lands (45,000 acres) would be open to winter use of snowmobiles of 1,000 pounds curb weight and less limiting recreational opportunities to non-motorized summer access, while allowing winter motorized use. Recreation users may experience conflicts between different user groups. Aircraft use would be unrestricted and this may directly and indirectly impact users. A permit or approved plan of operation would be required for all other forms of OHV use. If permitted these activities could create conflicts between different user groups. Effects would depend on the size of vehicle, route, and season of travel.

Effects from Special Designations

Designation of 927,000 acres within the Steese NCA as the Steese ACEC (Map 65) with restrictions and limitations of resource development would protect recreation resources and experiences of naturalness in all underlying ROS settings. Impacts to recreation use may occur if restrictions are placed on facilities development and use in order to maintain caribou and Dall sheep habitat in all ROS settings underlying important habitat.

The management of Big Windy and Mount Prindle RNAs, within the Steese NCA (Map 65) to protect the natural process and type needs identified for each, would protect recreation resources and experiences of naturalness and a closeness to the sights and sounds of nature in these areas identified as Primitive under the ROS. Prohibiting camping associated with recreational activities within the boundaries of the RNAs would impact recreation experiences by not allowing users to camp in close proximity to the area of activity, increasing travel time and the possible creation of unsustainable social routes as people hike over the same route to access climbing areas and enjoy hot spring areas.

One additional river segment, Big Windy Creek, totaling 14 miles within the Steese NCA, would be recommended for designation to the National Wild and Scenic Rivers System as a “wild” river (Map 71). The designation of this river by Congress would ensure the protection and enhancement of the outstandingly remarkable scenic, wildlife, and geologic values for which the river was identified, providing long-term, benefits to recreation experiences of naturalness and a closeness to the sights and sounds of nature on 4,500 acres.

Effects from management of Birch Creek WSR would be the same as Alternative A.

4.5.2.2.3. Alternative C

In general, Alternative C anticipates a moderate level of resource development. Recreation experiences trend towards those dependent on moderately developed activities with medium sized user groups in a naturally appearing landscape. The major experiences and benefits managed for include escape personal pressures and crowds, experiencing nature and solitude, and exploration of nature. The ROS ranges from Primitive to Frontcountry.

Effects from Fish and Aquatic Species

Effects would be similar to Alternative B. However, only 18 RCAs and three High Priority Restoration Watersheds would be identified. Portions of 15 of the RCAs and portions of all three Restoration Watersheds are located within the Steese NCA. Impacts to recreation would occur if these are applied in Backcountry, Middlecountry and Frontcountry ROS settings where development of recreation facilities would most likely occur, and users want to enjoy riparian areas and want developed access to water sources. Development of recreation facilities such as campgrounds, trailheads, and trails would most likely only impact five acres per developed area.

Effects from Visual Resources

As in Alternative B, managing visual resources is important for maintaining naturalness, and maintaining the natural setting is a key component in every recreation opportunity setting description. Under Alternative C, the VRM decisions would protect the recreation experience for Birch Creek WSR Corridor and the Primitive RMZs within the Steese NCA, with an assigned VRM Class I objective to preserve the existing character of the landscape yet allow very limited management activities. The level of change to the landscape should be very low and must not attract attention of a casual observer. This objective will allow for facilities development in protection of resources while maintaining the naturalness of the zones and protecting the experience of naturalness and the closeness of nature in a natural landscape. Approximately 102,000 acres would be managed as VRM Class I, including 87,000 acres outside the Steese NCA.

The Semi-Primitive RMZs within the Steese NCA (other than Birch Creek RMZ), Backcountry RMZs, and lands with wilderness characteristics would be assigned a VRM Class II with an

objective to retain the existing character of the landscape where the level of change to the characteristic landscape should be low and management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape. This would allow for some facilities development and small groups to enjoy the natural sights and sounds of nature in a naturally appearing landscape. Approximately 578,000 acres in the Steese NCA would be managed as VRM Class II.

Visual Resource Management Class IV would be assigned to Middlecountry and Frontcountry RMZs (within the Steese NCA), and other BLM lands where the objective is to allow for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. Every attempt would be made, however, to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements. Recreation activities based on elements of solitude and experiences of naturalness would be impacted by development of these lands, from medium to large surface-disturbing activities, if visible from the Foreground-Middleground Zone or from an elevated location. Approximately 611,000 acres, including 566,000 acres in the Steese NCA, would be managed as VRM Class IV.

Effects from Wilderness Characteristics

The maintenance of wilderness characteristics on 647,000 acres would directly protect the Primitive and Semi-Primitive RMZs where naturalness and solitude enhance the experiences and enjoyment of the sights and sounds of nature and closeness to the natural environment, and the experiences of escaping from crowds and the pressures of daily life. All of the 3,000 acres identified as Primitive are also identified for maintenance of wilderness characteristics. Of the 523,000 acres identified as Semi-Primitive, 479,000 acres are also identified for maintenance of wilderness characteristics, including lands within the Birch Creek WSR Corridor. Maintenance of wilderness characteristics in the Backcountry RMZ would protect naturalness and solitude but may limit the development of recreation facilities on 154,000 acres. Approximately 578,000 acres of lands with wilderness characteristics are within the Steese NCA.

Effects from Wildlife

Under Alternative C, the effects from Wildlife Management would essentially be the same as Alternative B, except the use of domestic goats, sheep and camelids in Dall sheep habitat would be allowed. It is anticipated that this is a small user group but interest has been growing in the lower 48 states.

Effects from Forest and Woodland Products

Under Alternative C, personal use of timber, commercial timber sales, and commercial use of forest products would be allowed on 1,156,000 acres within the SRMA, including most of the Steese NCA. These management actions could impact recreation resources and experiences of naturalness and closeness to nature in Semi-Primitive and Backcountry Zones. In Middlecountry and Frontcountry Zones, impacts would be less due to the more developed nature of these settings. Impacts would depend on the size of the area and harvest techniques used, but would likely be limited in scope, due to lack of valuable timber and lack of demand.

Timber salvage sales could be considered on 1,245,000 acres within the SRMA, with impacts dependent on the location, size of the area and harvest techniques used. It is assumed that demand for salvage sales would be low and impacts would be correspondingly low.

Personal use of timber, timber salvage sales, commercial timber sales, and commercial use of forest products would be allowed within other BLM lands where impacts to recreation experiences and opportunities would depend on the size of the area and harvest techniques used. It is assumed that the use of forest and woodland products would be low on other BLM lands and thus impacts would also be low.

Effects from Land and Realty

Land use authorizations such as leases and rights-of-way could indirectly and directly impact recreation resources and experiences of naturalness and escape from crowds and pressures of life if leases or rights-of-ways were allowed in Primitive, Semi-Primitive and Backcountry recreational opportunity spectrum settings (679,000 acres of which 87,000 acres are outside the Steese NCA).

Two transportation corridors within the Steese NCA are identified under this alternative. To the extent possible, all rights-of-way would be limited to these corridors. The use of corridors to concentrate use would impact the recreational opportunity spectrum settings they are located within, but would enhance other recreational opportunity spectrum settings where no corridors exist and rights-of-way may proliferate.

The Montana-Preacher Creek corridor is located within the Middlecountry Preacher Creek RMZ. The corridor would impact the naturalness of the area if it were developed. However; it could also provide access to some remote areas enhancing recreation opportunities by making more areas available for primitive type recreational experiences of solitude and escape from crowds. The corridor could impact up to 10,000 acres of the Preacher Creek RMZ, however impacts would be minimal because the Steese SRMA would remain closed to mineral entry and rights-of-ways associated with mining would be limited.

The Great Unknown Creek corridor is located in the Frontcountry Harrison RMZ, the Semi-Primitive Birch Creek RMZ, and the Middlecountry Clums Fork RMZ. The Middlecountry prescription allows for development of facilities as long as they blend with the surrounding landscape. Allowing development within this zone would enhance recreation experiences by providing access. Development of facilities within Semi-Primitive Zone would impact the naturalness of the area, but are allowed if they are designed to blend with the surrounding landscape. Other restrictions may apply due to the "wild" river designation. Within the Frontcountry prescription, development of facilities are generally allowed because they enhance recreation opportunities, making areas available for recreation experiences with family and small groups yet allowing for experiences of nature and the escape from crowds and pressures of life. The transportation corridor could impact up to 12,000 acres of the Harrison Creek RMZ, 3,000 acres of the Birch Creek RMZ and 3,000 acres of the Clums Fork RMZ.

Maintaining the ANILCA withdrawal from locatable mineral entry on lands within Big Windy and Mount Prindle RNAs, Birch Creek, Pinnell Mountain, Wolf Creek, Rock Creek and Rocky Mountains RMZs, the Steese ACEC, the Bachelor Creek section of Preacher Creek RMZ, all Riparian Conservation Areas and 1,500 acres of Harrison Creek would enhance the naturalness experience in these areas by not allowing surface disturbance activities associated with mineral development on 955,000 acres all within the Steese NCA.

Portions of Birch Creek, Pinnell Mountain and Preacher Creek RMZs would be closed to locatable minerals (18,000 acres). These lands are outside the Steese NCA and Birch Creek WSR Corridor but are adjacent to these units and the closer would enhance the naturalness experience by not allowing surface disturbance activities associated with mineral development.

Effects from Minerals

Closing 992,000 acres to fluid leasable minerals and solid leasable minerals, and locatable minerals would protect recreation resources and experiences of naturalness and escape from crowds by not allowing surface-disturbing activities related to mineral development in the Primitive, Semi-Primitive (87,000 acres within the Birch Creek WSR Corridor), and Backcountry recreational opportunity spectrum settings, the Steese ACEC and the Bachelor Creek portion of Preacher Creek RMZ. The recreation settings would be protected on 751,000 acres within the Steese NCA. An additional 172,000 acres would be open to fluid and solid leasable minerals with minor constraints, however these constraints would have little impacts to recreational experiences and naturalness.

Seismic exploration activities could impact recreation by improving winter access through the clearing of seismic lines. Impacts to naturalness could occur through the clearing of lines for both summer and winter recreation and the experience of escape from crowds would be impacted during seismic operations.

Closing 69,000 acres to salable minerals would protect recreation resources and experiences of naturalness and escape from crowds by not allowing surface-disturbing activities related to mineral development in the Birch Creek RMZ. The remainder of the SRMA would be open to salable minerals. Impacts recreation resources and experiences of naturalness and escape from crowds would depend on the access, location, and size. It is anticipated that demand for mineral materials in the Steese Subunit would be met from sources on state land and that most sales would be located close to roads. No new mineral sales on BLM lands are anticipated.

Other BLM lands would be open to leasable, locatable and salable minerals, impacting recreation activities by development activities enhancing access but also causing surface disturbance in otherwise natural areas.

Effects from Recreation

Management actions would provide for multiple recreation activities within five Zones. The Mount Prindle and Big Windy RNAs (3,000 acres) would be managed as Primitive, all within the Steese NCA. The Rock Creek, Wolf Creek, Birch Creek and Pinnell Mountain RMZs (523,000 acres) would be managed as Semi-Primitive, all within the Steese NCA except 99,000 acres of the Birch Creek RMZ. The Rocky Mountain Uplands RMZ (154,000 acres) would be managed as Backcountry, also within the Steese NCA. The Preacher Creek and Clums RMZs, would be managed as Middlecountry (452,000 acres), the Harrison RMZ (114,000 acres) would be managed as Frontcountry, all within the Steese NCA.

The Primitive Zone (less than one percent) accounts for the smallest setting, while Semi-Primitive accounts for forty-two percent. The Backcountry zone accounts for twelve percent. The Middlecountry Zone accounts for thirty-six percent and Frontcountry accounts for nine percent.

These percentages are indicative of the management emphasis for recreation activities on BLM-managed lands within the subunit. Less than one percent of the SRMA would be managed

for the Primitive experiences, minimal facilities development for resource protection and small user groups generally of three or fewer persons. This setting would protect and enhance the experiences of naturalness, escape from crowds and solitude. Semi-Primitive areas would be managed for winter motorized use, rustic and rudimentary facilities development generally constructed using natural materials, and designed to blend with surrounding landscape and small user groups generally of four or fewer persons. Backcountry experiences of motorized use, with small facilities development (approximately three acres) generally constructed using naturally appearing materials, and designed to blend with surrounding landscape to support user groups of up to seven people average. Middlecountry is the second largest setting and would be managed for cross-country winter use and summer motorized use on designated routes, some development of medium sized facilities (generally less than five acres per site), opportunities for larger group activities or party sizes in a partially modified landscape. Experiences of escape from pressures, crowds and exploration of areas could occur in larger groups of 10 people average with more developed facilities. The Frontcountry setting would be managed for cross-country winter and summer motorized use on designated routes, some development of larger sized facilities (over five acres per site), opportunities for larger group activities or party sizes in a partially modified landscape. Experiences of escape from pressures, crowds and exploration of areas could occur in larger groups of 12 people average with more developed facilities.

Other BLM lands would not be managed under a recreation opportunity spectrum setting and would not be managed for an identified range of experiences or activities.

Effects from Travel Management

Travel management prescriptions for the Primitive Zones of Mount Prindle and Big Windy RNAs would allow non-motorized travel and aircraft landings without clearing of vegetation, limiting recreational opportunities but enhancing self-reliance, naturalness and closeness to nature and escape from crowds. A permit or approved plan of operation would be required for all forms of OHV use (including clearing of vegetation for aircraft landings), which could impact naturalness and solitude for users. Impacts would depend on the size of vehicle, route and season of travel. Closure of these areas (3,000 acres) to OHV use would negatively impact activities such as hunting and trapping that depend on motorized vehicles for access, and activities that benefit from motorized use such as cross-country skiing and dogmushing where vehicles are used to set trails or tracks.

Travel management prescriptions for the Semi-Primitive Zones of Birch Creek, Pinnell Mountain, Rock Creek and Wolf Creek RMZs, and the Backcountry Rocky Mountain Uplands RMZ, would allow winter use of snowmobiles of 1,000 pounds and less, limiting recreational opportunities to non-motorized summer OHV access, while allowing winter motorized use and motorboats. Aircraft use would be unrestricted and this may directly and indirectly impact naturalness and solitude for users. A permit or approved plan of operation would be required for all other forms of OHV use. If permitted, these activities could impact naturalness and solitude for users and would depend on the size of vehicle, route and season of travel. Closure of 680,000 acres in these areas to summer OHV use would negatively impact motorized assisted activities such as hunting. All of these areas except 99,000 acres of the Birch Creek RMZ are located within the Steese NCA.

Within the Birch Creek WSR Corridor and the Steese NCA, the use of hovercraft, airboats and personal water craft would not be allowed. above the confluence of Birch Creek and the South Fork of the Yukon Fork of Birch Creek.

The Middlecountry Zones of Preacher Creek and Clums RMZs, and the Frontcountry Harrison RMZ would be open to cross-country winter use of snowmobiles of 1,000 pounds curb weight and less, and summer use of vehicles 1,000 pounds curb weight and less on existing routes only, except for game retrieval. These management actions would limit recreational opportunities for cross-country summer travel. Recreation users may experience conflicts between different user groups. Aircraft use would be unrestricted and this may directly and indirectly impact naturalness and solitude for users. A permit or approved plan of operation would be required for all other forms of OHV use. Impacts would depend of the size of vehicle, season of travel and area of travel. If permitted these activities could create conflicts between different user groups. Restricting summer use to existing routes would negatively impact summer motorized activities such as hunting and free riding on 566,000 acres.

Other BLM lands (45,000 acres) would be open to winter use of snowmobiles of 1,000 pounds curb weight and less, and summer use of vehicles with a 1,000 pounds curb weight and less on existing routes only, except for game retrieval. This prescription would limit recreational opportunities such as hunting and free riding. Recreation users may experience conflicts between different user groups. Aircraft use would be unrestricted and this may directly and indirectly impact users. A permit or approved plan of operation would be required for all other forms of OHV use. Impacts would depend of the size of vehicle, season of travel and area of travel. If permitted these activities could create conflicts between different user groups.

Effects from Special Designations

Designation of 460,000 acres as the Steese ACEC (Map 66) with restrictions and limitations of resource development would protect recreation resources and experiences of naturalness in all underlying ROS settings. All of the Steese ACEC is within the Steese NCA. Impacts to recreation use may occur if restrictions are placed on facilities development and use in order to maintain caribou and Dall sheep habitat and mineral licks in all ROS settings underlying important habitat and mineral licks sites.

The management of Big Windy and Mount Prindle RNAs (3,000 acres) within the Steese NCA, to protect the natural process and type needs identified for each RNA, would protect recreation resources and experiences of naturalness and a closeness to the sights and sounds of nature in these areas which are identified as Primitive (Map 66). Allowing camping associated with recreational activities within the RNAs would enhance recreation experiences by allowing users to camp in close proximity to the area of activity, some short unsustainable social routes may develop as people hike over the same route to access climbing areas and enjoy hot spring areas.

Effects from management of Birch Creek WSR would be the same as Alternative A.

4.5.2.2.4. Alternative D

In general, Alternative D anticipates the most resource development. Recreation experiences trend towards those dependent on more developed activities with larger sized user groups in a naturally appearing landscape. The major experiences and benefits managed for include escape personal pressures and crowds, experiencing nature, and exploration of nature. The ROS ranges from Primitive to Frontcountry.

Effects from Fish and Aquatic Species

Effects would be similar to Alternatives B and C, but less since only eight RCAs and three High Priority Restoration Watersheds are identified. Portions of seven of the RCAs and portions of all three Restoration Watersheds are located within the Steese NCA. Impacts to recreation would occur if these are applied in Middlecountry and Frontcountry ROS settings, where development of recreation facilities would most likely occur, and where users want to enjoy riparian areas and want developed access to water sources. Development of recreation facilities such as campgrounds, trailheads, and trails would most likely only impact five acres per developed area.

Effects from Visual Resources

As in Alternative B, managing visual resources is important for maintaining naturalness, and maintaining the natural setting is a key component in every recreation opportunity setting description. Under Alternative D, VRM decisions would protect the recreation experience for the Birch Creek RMZ and Primitive RMZs with an assigned VRM Class I objective to preserve the existing character of the landscape yet allow very limited management activities. The level of change to the characteristic landscape should be very low and must not attract attention of a casual observer. This objective would allow for facilities development in protection of resources while maintaining the naturalness of the zones and protecting the experience of naturalness and the closeness of nature in a natural landscape. Approximately 90,000 acres would be managed as VRM Class I, including 87,000 acres outside the Steese NCA.

The Semi-Primitive RMZs and Backcountry RMZs would be assigned a VRM Class II with an objective to retain the existing character of the landscape where the level of change to the characteristic landscape should be low and management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape. This would allow for some facilities development and small groups to enjoy the natural sights and sounds of nature in a naturally appearing landscape. Approximately 423,000 acres in the Steese NCA would be managed as VRM Class II.

No RMZs would be assigned a VRM Class III.

Visual Resource Management Class IV would be assigned to Middlecountry and Frontcountry RMZs and other BLM lands where the objective is to allow for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt would be made to minimize the impacts through careful location, minimal disturbance, and repeating the basic elements. Recreation activities based on elements of solitude and experiences of naturalness would be impacted by development of these lands from medium to large surface-disturbing activities if visible from the Foreground-Middleground Zone or from an elevated location. Approximately 778,000 acres, including 733,000 acres in the Steese NCA, would be managed as VRM Class IV.

Effects from Wilderness Characteristics

The maintenance of wilderness characteristics on 483,000 acres, all within the Steese NCA, would directly protect Primitive and Semi-Primitive RMZs where naturalness and solitude enhance the experiences and enjoyment of the sights and sounds of nature and closeness to the natural environment, and the experiences of escaping from crowds and the pressures of daily life. Of the 3,000 acres identified as Primitive, one-hundred percent is identified for maintenance of wilderness characteristics. Of the 103,000 acres identified as Semi-Primitive, 71,000 acres are

identified for maintenance of wilderness characteristics. Additionally, wilderness characteristics would be maintained in the Wolf Creek Backcountry RMZ (325,000 acres). Maintenance of wilderness characteristics in the Backcountry RMZ would protect naturalness and solitude but may limit the development of recreation facilities on 407,000 acres. Approximately 483,000 acres of lands with wilderness characteristics are within the Steese NCA.

No areas with wilderness characteristics were identified on other BLM lands.

Effects from Wildlife

Same as Alternative C.

Effects from Forest and Woodland Products

Effects under Alternative D would be similar to Alternative C. The primary difference is that personal of timber products would be considered in a larger area (1,245,000 acres), including the Birch Creek WSR Corridor and the RNAs. Commercial timber sales would be allowed on 1,156,000 acres within the SRMA (excludes the Birch Creek WSR Corridor and the RNAs). These management actions could impact recreation resources and experiences of naturalness and closeness to nature in Semi-Primitive and Backcountry Zones. Impacts would depend on the location, size of the area and harvest techniques used.

Effects from the commercial use of forest products in the SRMA would be the same as Alternative C. Effects from harvest of forest and woodland products on other BLM lands would also be the same as Alternative C.

Effects from Land and Realty

Land use authorizations such as leases and rights-of-way could indirectly and directly impact recreation resources and experiences of naturalness and escape from crowds and pressures of life if allowed in Primitive, Semi-Primitive and Backcountry recreational opportunity spectrum settings. Impacts would depend on the size of the project, use, and associated facilities. No right-of-way avoidance areas or transportation corridors are identified.

Portions of Birch Creek and Pinnell Mountain RMZs would be closed to locatable minerals (17,000 acres). These lands are outside the Steese NCA and Birch Creek WSR Corridor but are adjacent to these units and the closer would enhance the naturalness experience by not allowing surface disturbance activities associated with mineral development.

Effects from Minerals

Closing 583,000 acres to leasable and locatable minerals would protect recreation resources and experiences of naturalness and escape from crowds by not allowing surface-disturbing activities related to mineral development in the Primitive, Semi-Primitive, and Backcountry recreational opportunity spectrum settings, the Steese ACEC and the Bachelor Creek portion of Preacher Creek RMZ. Of the closed acres, all but 87,000 acres associated with Birch Creek WSR Corridor and 2,000 acres of other lands are located inside the Steese NCA.

Seismic exploration activities could impact recreation by improving winter access through the clearing of seismic lines. Impacts to naturalness could occur through the clearing of lines for both summer and winter recreation and the experience of escape from crowds would be impacted during seismic operations throughout the subunit including the Steese NCA.

The entire SRMA (1,246,000 acres) including the Steese NCA, would be open to salable minerals. Impacts to recreation resources and experiences of naturalness and escape from crowds would depend on the access, location, and size. It is anticipated that demand for mineral materials in the Steese Subunit would be met from sources on state land and that most sales would be located close to roads. No new mineral sales on BLM lands are anticipated.

All other BLM lands would be open to fluid and solid mineral leasing, locatable and salable minerals impacting recreation activities by development activities enhancing access but also causing surface disturbance in otherwise natural areas.

Effects from Recreation

Management actions would provide for multiple recreation activities within five recreation opportunity spectrum settings. The Mount Prindle and Big Windy RNAs (3,000 acres) would be managed as Primitive, both within the Steese NCA. The Birch Creek and Pinnell Mountain RMZs (104,000 acres of which 87,000 acres are outside the Steese NCA) would be managed as Semi-Primitive. The Rocky Mountain Uplands and Wolf Creek RMZs (407,000 acres) would be managed as Backcountry, both within the Steese NCA. The Preacher Creek and Clums RMZs (608,000) acres would be managed as Middlecountry and the Harrison RMZ (124,000 acres) would be managed as Frontcountry, all within the Steese NCA.

The Primitive RMZ (less than one percent) accounts for the smallest setting, while Semi-Primitive accounts for eight percent. The Backcountry RMZ accounts for thirty-three percent. The Middlecountry RMZ accounts for forty-nine percent, while Frontcountry accounts for ten percent.

These percentages are indicative of the management emphasis for recreation activities on BLM-managed lands within the subunit. Less than one percent of the SRMA would be managed for the primitive experiences, minimal facilities development for resource protection and small user groups generally of three or fewer persons. This setting would protect and enhance the experiences of naturalness, escape from crowds and solitude. Semi-Primitive areas (eight percent) would be managed for winter motorized use, rustic and rudimentary facilities development generally constructed using natural materials, and designed to blend with surrounding landscape and small user groups generally of four or fewer persons. Backcountry experiences of motorized use, with small facilities development (approximately three acres) generally constructed using naturally appearing materials, and designed to blend with surrounding landscape to support user groups of up to seven people average. Middlecountry is the largest setting (forty-nine percent) and would be managed for cross-country winter use and summer motorized use on designated routes, some development of medium sized facilities (generally less than five acres per site), opportunities for larger group activities or party sizes in a partially modified landscape. Experiences of escape from pressures, crowds and exploration of areas could occur in larger groups of 10 people average with more developed facilities. The Frontcountry setting would be managed for cross-country winter and summer motorized use on designated routes, some development of larger sized facilities (over five acres per site), opportunities for larger group activities or party sizes in a partially modified landscape. Experiences of escape from pressures, crowds and exploration of areas could occur in larger groups of 12 people average with more developed facilities.

Other BLM lands would not be managed under a recreation opportunity spectrum setting and would not be managed for an identified range of experiences or activities.

Effects from Travel Management

The Primitive Mount Prindle and Big Windy RNAs, both within the Steese NCA, would be open to non-motorized travel and aircraft landings without clearing of vegetation, limiting recreational opportunities but enhancing self-reliance, naturalness and closeness to nature and escape from crowds. A permit or approved plan of operation would be required for all forms of OHV use (including clearing of vegetation for aircraft landings). If permitted, these activities could impact naturalness and solitude for users. Impacts would depend on the size of vehicle, route and season of travel. Closure of 3,000 acres in these areas to OHV use would negatively impact activities such as hunting and trapping that depend on motorized vehicles for access, and activities that benefit from motorized use such as cross-country skiing and dogmushing where vehicles are used to set trails or tracks.

The Semi-Primitive Zones of Birch Creek (87,000 acres outside the Steese NCA) and Pinnell Mountain RMZs, and the Backcountry Zones of Rocky Mountain Uplands and Wolf Creek RMZs, would be open to winter use of snowmobiles of 1,000 pounds curb weight and less limiting recreational opportunities to non-motorized OHV summer access, while allowing winter motorized use and motorboats. A permit or approved plan of operation would be required for all other forms of OHV use. If permitted, these activities could impact naturalness and solitude for users and would depend on the size of vehicle, route and season of travel. Aircraft use would be unrestricted and this may directly and indirectly impact naturalness and solitude for users. Closure of 510,000 acres to summer OHV use would negatively impact motorized assisted activities such as hunting.

Within the Birch Creek WSR Corridor and the Steese NCA, the use of hovercraft, airboats and personal water craft would not be allowed. Motorized boats would not be allowed above the confluence of Birch Creek and the South Fork of the Yukon Fork of Birch Creek.

The Middlecountry Preacher Creek and Clums RMZs and the Frontcountry Harrison RMZ, all within the Steese NCA, would be open cross-country winter and summer use of vehicles of 1,000 pounds curb weight and less, allowing for both summer and winter motorized use off of existing routes on 733,000 acres. Recreation users may experience conflicts between different user groups. A permit or approved plan of operation would be required for all other forms of OHV use and impacts would depend of the size of vehicle, season of travel and area of travel. If permitted these activities could create conflicts between different user groups. Aircraft use would be unrestricted and this may directly and indirectly impact naturalness and solitude for users.

Other BLM lands (45,000 acres) would be open to cross-country winter and summer use of vehicles of 1,000 pounds curb weight and less, allowing for free travel for recreational activities such as hunting, trapping and free riding. Effects would be similar to the Middlecountry and Frontcountry Zones.

Effects from Special Designations

Designation of 193,000 acres as the Steese ACEC (Map 67), all within the Steese NCA, with restrictions and limitations of resource development would protect recreation resources and experiences of naturalness in all underlying ROS settings. Impacts to recreation use may occur if restrictions are placed on facilities development and use in order to maintain caribou and Dall sheep habitat and mineral licks in all ROS settings underlying important habitat and mineral licks sites.

Effects from RNAs would be the same as Alternative C. Effects from management of Birch Creek WSR would be the same as Alternative A.

4.5.2.2.5. Cumulative Impacts

The effects of past, present and future actions, including the demand for recreational use, changes to the landscape as a result of surface-disturbing activities, and area closures or restrictions for resource protection, could affect recreation management in the Steese Subunit.

The demand for recreational use in the Steese Subunit is anticipated to increase by ten to fifteen percent over the life of the plan, due to general population increases, increases in recreation-related technology, and shifts from other public use areas where visitors are experiencing crowding. This use would occur for both non-motorized (such as hiking, backpacking, hunting, float-boating, river-based recreation, camping, fishing, and gathering of edible plants and berries) and motorized (such as OHV use, including snowmobiles) activities, resulting in changes to the natural landscape and experiences of solitude, escape from crowds and experiences of the sights and sounds of nature. As use increases, there is potential for increasing conflicts among recreationalists seeking similar experiences through different activities, generally between non-motorized users and motorized users, but also conflicts between different uses such as mineral development and recreation.

Surface-disturbances resulting from mineral activities, forestry and unmitigated OHV use could cumulatively affect recreational users if activities were concentrated in heavily recreated areas and if activities overlapped in duration. Effects to recreation as a result of these cumulative effects may include the potential dislocation of wildlife for hunting and viewing purposes, and/or the alteration of naturally appearing, scenic viewsheds.

Special designations, including ACECs and WSRs, would further protect the Steese Subunit, by increasing wildlife numbers that benefit wildlife viewing, hunting, and fishing opportunities. As the size and scope of these areas change, opportunities for land and water based recreation uses that incorporate scenic viewsheds as part of the experience would also change. However, as areas that require special management attention, to prevent irreparable damage to historic, cultural and scenic values, the need for additional restrictions could limit motorized use and other recreational activities and experiences.

Implementing each alternative would contribute to a significant change to recreational opportunities on public lands with Alternative B limiting motorized use and enhancing the primitive experience for non-motorized use, Alternative C balancing motorized and non-motorized use and Alternative D enhancing motorized use and more developed recreation opportunities.

4.5.2.3. Travel Management Steese Subunit

Summary of Effects

Effects on travel management from the proposed alternatives would result in a wide range of possible outcomes. Site-specific measures to protect and preserve recreation resources and other sensitive resource values, including fish and wildlife, soil, water, Special Status Species, and cultural and paleontological resources, could result in seasonal or permanent route restrictions or closures. Surface-disturbing activities, caused by forestry and mineral actions, could affect travel management through the expansion of the existing transportation network.

Alternative C would provide the greatest range of motorized and non-motorized recreation experiences, while protecting area resources and minimizing user conflicts. It would be followed

by Alternative B, then A, with Alternative D having the most potential for resource impacts and conflict among users.

Table 4.13. Comparison of OHV Designations: Steese Subunit

Area Designation	Alternative							
	A		B		C		D	
	Acres	%*	Acres	%*	Acres	%*	Acres	%*
Year-round								
Undesignated	63,000	4	0	0	0	0	0	0
Open	0	0	0	0	0	0	0	0
Closed	3,000	<1	3,000	<1	3,000	<1	3,000	<1
Limited	1,225,000	95	1,288,000	99	1,288,000	99	1,288,000	99
Winter (October 15 through April 30)								
Limited: Cross-country use of vehicles 1,000 pounds curb weight and less allowed	1,225,000	95	1,288,000	99	1,288,000	99	1,288,000	99
Summer (May 1 through October 14)								
Limited: Cross-country use of vehicles 1,000 pounds curb weight and less allowed	1,083,000	84	0	0	0	0	778,000	60
Limited: Existing Routes and 1,000 pounds curb weight and less (except for game retrieval)	0	0	0	0	611,000	47	0	0
Limited: Closed to summer OHV use ^b	142,000	11	1,288,000	99	677,000	52	510,000	39

*Percent of the lands within the Steese Subunit (1,291,000 acres), include 14,000 acres of state inholdings in the Steese NCA. Management would not apply to state land unless acquired by BLM.

^bAdditive to lands under a year-round Closed Area Designation

All of the Steese NCA will either be Limited or Closed OHV designation under Alternatives B, C and D.

4.5.2.3.1. Effects Common to All Alternatives

Effects from Locatable Minerals

Placer mining activities have the potential to affect travel and transportation management through the expansion of the existing route network. The construction of winter roads and trails for mineral development would provide a direct benefit to OHV users through the enhancement of public access opportunities. These effects would be the highest under Alternative D, followed by Alternatives C, B, and A.

Effects from Travel Management

Under all alternatives, travel management actions would continue to provide for a range of motorized and non-motorized opportunities, while protecting resource values and minimizing user conflicts. This would allow the BLM to sustain and enhance travel opportunities and experiences, visitor access and safety, and resource conservation.

Approximately 200 miles of existing recently used summer routes were identified for interim management (Maps 54, 55 and 56) until a Travel Management Plan can be developed. Since all public lands are required to have OHV area designations, Travel Management Zones (TMZs) were designated as Limited or Closed. No areas were designated as Open. Limited designations may

restrict motorized vehicles to existing routes, weight, and/or season of use. Closed designation prohibits off-road vehicle use year round.

Under all alternatives, non-motorized travel (e.g., float-boating, pedestrian, equestrian, and mountain bikes) would continue to be allowed on all the BLM lands in the Steese Subunit (1,290,000 acres). There would be no change from current management, and opportunities would continue for visitors who access public lands by float-boat (e.g., rafts, kayaks, and canoes), foot, horse, or bicycle. Fixed-wing and helicopter access would remain generally unrestricted, except in Primitive Zones where landing without a permit would be allowed as long as no clearing of vegetation occurs.

The Steese Subunit would continue to be managed in support of its waterways and non-motorized cross-country travel routes, to provide opportunities of a more primitive nature.

Effects from Special Designations

Under all alternatives, the 126 miles of Birch Creek WSR, as designated through ANILCA, would continue to be managed as a “wild” river pursuant to the WSRA. Management of “wild” rivers, per BLM guidance, would impact travel in Birch Creek WSR Corridor where the construction of new roads, primitive roads, trails, or other provisions for overland motorized travel would not be permitted (BLM 8351 Manual).

Research Natural Areas would be open to non-motorized travel and aircraft landings without clearing of vegetation. Development of non-motorized trails may occur.

4.5.2.3.2. Alternative A (No Action)

Effects from Forest and Woodland Products

Commercial Timber harvest is not allowed in the Steese NCA. Current levels of timber and forest product harvest for personal use have minimal effects on travel and transportation management. Permits are monitored to ensure that the authorized amounts, locations, and stipulations of the permit have been followed. Proliferation of routes could occur, but stipulations for winter cutting or walk-in only would limit this impact. This program could affect travel management through the expansion of the existing transportation network or if restrictions or emergency closures became necessary, to mitigate impacts to damaged areas.

Effects from Lands and Realty

Maintaining four transportation corridors in the Steese NCA will allow for concentrated travel within these corridors and could possibly restrict the development of rights-of-ways in other areas. The four corridors cover 53,000 acres. No withdrawal review would occur and the ANCSA 17(d)(1) withdrawals would be retained. This would limit the need for winter overland move routes and summer travel associated with mining to areas with current or historic travel routes. There may be a need for a few additional travel routes associated with current mining claims.

Effects from Recreation

This alternative provides the most motorized public access of any of the alternatives. Travel would remain limited to vehicles 1,500 pounds GVWR and less, except for RNAs, which are closed to OHV use. Thus, while this alternative would offer the most opportunities for recreational activities

that involve the use of motorized travel, including hunting and OHV riding; fewer opportunities would exist for recreational users seeking a primitive, non-motorized type of experience.

Effects from Travel Management

This alternative would provide the most motorized and mechanized public access, as travel and transportation would continue to manage 1,065,000 acres (eighty-four percent) as limited to summer-motorized use and 1,200,000 acres (ninety-nine percent) as limited to winter-motorized use. Only the RNAs (3,000 acres) are closed to OHV use. Limited only by weight (1,500 pounds GVWR and less), this alternative would provide the greatest opportunity for those users seeking cross-country motorized activities.

4.5.2.3.3. Alternative B

Effects from Forest and Woodland Products

Effects would be similar to those identified under Alternative A, except personal use of timber, commercial/salvage timber sales, and commercial forest product harvest would not be allowed within the Steese SRMA (inclusive of the Steese NCA). On all other lands, 45,000 acres, these uses would be considered. Effects would be negligible.

Effects from Lands and Realty

Under Alternative B, relinquishing two of the transportation corridors could limit access to parts of the Steese NCA for rights-of-way (ROW), recreation, mining and other possible transportation activities. However, rights-of-way (ROW) could still be authorized, even without a designated transportation corridor. ROW could be more dispersed throughout the NCA, rather than being limited to a corridor. The Montana Creek to Preacher Creek Corridor and the Great Unknown Creek Corridor would remain, covering 29,000 acres.

The Steese ACEC, Birch Creek WSR Corridor, and RNAs would be a ROW avoidance areas, potentially limiting future transportation routes. Effects would likely be minimal due to the anticipated lack of demand for ROW within these areas.

Effects from Recreation

The ROS setting provides a framework for identifying the types of recreation activities that the public might desire and is directly related to the travel and transportation management opportunities available in those areas. The ROS setting for this alternative would maintain twenty percent (87,000 acres in Semi-Primitive and 124,000 acres in Backcountry RMZs) of the Steese Subunit as Semi-Primitive and Backcountry. The remaining eighty percent (1,034,000 acres in Primitive RMZs) would be managed for a Primitive experience. Since RMZs and Travel Management Zones (TMZs) are delineated with the same boundaries under each alternative and were designed to complement one another, impacts from recreation are expected to be minimal.

Effects from Travel Management

Under this alternative, eighty percent of the Steese Subunit (eighty-six percent of the Steese NCA) would be designated as Closed to summer OHV use. The remaining twenty percent would be designated as Limited with seasonal and weight restrictions. Winter motorized use of snowmobiles would be allowed on 87,000 acres associated with Birch Creek WSR Corridor and 124,000 acres within the Steese NCA on Backcountry designated lands. All other OHV travel

would require a permit. The use of hovercraft, airboats and personal watercraft would not be allowed on within Birch Creek WSR and the Steese NCA.

Effects from Special Designations

Under Alternative B, the Steese ACEC (927,000 acres within the Steese NCA) would be subject to restrictions to winter motorized use if necessary to protect wildlife habitat.

Big Windy Creek (4,500 acres), within the Steese NCA, could be added to the NWSR as a “wild” river where no construction of new roads, trails or other provisions for overland motorized travel would be permitted within the river corridor.

4.5.2.3.4. Alternative C

Effects from Forest and Woodland Products

Effects would be similar to those identified under Alternative A, except personal use of timber and commercial timber sales would be allowed on ninety-three percent of the subunit. Only Birch Creek WSR and the RNAs would be closed to these uses. Commercial use of forest products (e.g., berries, bark) would be considered on ninety-nine percent of the subunit, only the RNAs would be closed. These activities would require either temporary winter access or more permanent summer access for both large and small motorized vehicles.

Effects from Lands and Realty

Same as Alternative B, except there would be no ROW avoidance areas.

Effects from Recreation

Similar to Alternative B, the BLM would continue to manage public lands for a variety of recreational activities within all ROS settings with similar effects. The ROS setting for Alternative C establishes forty-seven percent (including 452,000 acres Middlecountry, 114,000 acres Frontcountry, and 45,000 acres other BLM managed lands) of the subunit as limited (i.e., 1,000 pounds curb weight and less, existing routes except for game retrieval) to summer-motorized experiences, while fifty-three percent (523,000 acres Semi-Primitive, 154,000 acres Backcountry, and 3,000 acres Primitive) would be closed to summer OHV use. In contrast, during the winter, 99.8 percent of the subunit would be available to the winter use of snowmobiles, while 0.2 percent (Primitive RMZs) would be closed. Compared to Alternative B, fewer opportunities would exist for recreational users seeking primitive, non-motorized experiences, while more opportunities would be available for recreational activities that involve the use of motorized travel.

Effects from Travel Management

Under this alternative, ninety-nine percent of the subunit would be designated as Limited for OHV use with seasonal and weight restrictions. Less than one percent would be designated as Closed to OHV use. Winter motorized use of snowmobiles would be allowed on ninety-nine percent of the subunit; fifty-three percent would be closed to summer OHV travel. Summer motorized use of OHVs would be limited to existing routes on forty-seven percent of the subunit. All other OHV travel could be authorized by permit. The use of hovercraft, airboats and personal watercraft would not be allowed on within Birch Creek WSR and the Steese NCA on “wild” river segments above the confluence of Birch Creek and the South Fork of the Yukon Fork of Birch

Creek. This alternative offers more opportunity for motorized travel and access than Alternative B, but less than Alternative A.

Effects from Special Designations

Under Alternative C, a smaller Steese ACEC (460,000 acres) would be subject to restrictions to winter motorized use if necessary to protect wildlife habitat. No new rivers would be considered for designation. Effects on travel management would be less than under Alternative B.

4.5.2.3.5. Alternative D

Effects from Forest and Woodland Products

Effects would be similar to those identified under Alternative A. Under Alternative D, personal use of timber and timber salvage sales would be considered throughout the subunit and commercial timber sales would be allowed on ninety-three percent. Commercial use of forest products would be allowed on ninety-nine percent of the subunit, only the RNAs would be closed to this type of use. These activities would require either temporary winter access or more permanent summer access for both large and small motorized vehicles.

Effects from Lands and Realty

Under Alternative D, no transportation corridors would be designated. ROW would be considered throughout the subunit (1,275,000 acres), potentially resulting in additional access.

Effects from Recreation

Similar to Alternative C, the BLM would manage for a variety of recreational activities within all ROS settings. Effects would be similar to those identified under Alternative B. Under Alternative D, the ROS setting establishes sixty percent of the subunit (including 609,000 acres Middlecountry, 124,000 acres Frontcountry, and 45,000 other BLM managed lands) as limited (1,500 pounds curb weight and less) to summer-motorized experiences, while forty percent (3,000 acres Primitive, 103,000 acres Semi-Primitive, and 407,000 acres Backcountry) would remain closed to summer OHV use. In contrast, during the winter months, 99.8 percent of the subunit would be available to the winter use of snowmobiles, while 0.2 percent (3,000 acres Primitive RNA) would remain closed. Thus, while this alternative would offer the least opportunities for recreational users seeking primitive, non-motorized experiences, more opportunities would exist for recreational activities that involve the use of motorized travel, when compared to Alternatives B and C.

Effects from Travel Management

Same as Alternative C, ninety-nine percent of the Steese Subunit would be designated as Limited for OHV use; less than one percent would be designated as Closed to OHV use. Winter motorized use of snowmobiles would be allowed on ninety-nine percent of the subunit; cross-country summer motorized use of OHVs would be allowed on sixty percent. Only Primitive, Semi-Primitive and Backcountry RMZs (forty percent) would be closed to summer OHV use. Other OHV travel would be considered by permit only. The use of hovercraft, airboats and personal watercraft would not be allowed on within Birch Creek WSR and the Steese NCA on “wild” river segments above the confluence of Birch Creek and the South Fork of the Yukon Fork of Birch Creek.

Effects from Special Designations

Under Alternative D, the Steese ACEC (193,000 acres) would be subject to restrictions to winter motorized use if necessary to protect wildlife habitat. Effects would be less than Alternative C as the ACEC would be smaller.

4.5.2.3.6. Cumulative Impacts

The majority of existing routes in the Steese Subunit are the result of user-created routes that follow historic non recreational routes (such as, mining or administrative access) or were created by OHV users repeatedly driving cross-country. Accordingly, many of the existing routes are not sustainable from a resource management perspective, and can cause significant resource damage including, but not limited to, soil compaction, vegetation deterioration, or poor water quality. If not addressed, these impacts will continue to have an effect on travel and transportation management for years to come.

With increased pressures from growing populations and advances in recreational vehicle technology, the Steese Subunit is anticipated to experience a similar growth in travel-related land use and activity participation. Since OHV use accounts for the majority of travel-related activities in the subunit, it is perceived that the demand for this activity will be of greatest concern during the life of the plan. Given its current rate of user increase (approximately ten percent per year), motorized travel could potentially double within the next 10 years. As this occurs, the need for trails and mechanisms for managing these trails will become necessary.

Other lands in the subunit are managed by federal (NPS and USFWS), state, Native, and private entities. As a result, the rules and regulations governing the use of OHVs may differ slightly, when compared to BLM managed lands. For instance, the State of Alaska generally restricts OHVs to 1,500 pounds curb weight and allows cross-country travel in most areas as long as use does not cause or contribute to resource degradation. The BLM generally restricts OHVs to 1,000 pounds curb weight and under Alternatives B and C, would limit travel to existing routes and trails. This may lead to some confusion, if riders are unaware that they have crossed the boundary of a different management agency or entity. Consequently, a proliferation of user-created routes could occur along the boundaries of BLM lands.

4.5.3. Special Designations

4.5.3.1. Wild and Scenic Rivers Steese Subunit

Summary of Effects

Under all alternatives, the Birch Creek WSR will continue to be managed to protect the free-flowing characteristics of the river, water quality and Outstandingly Remarkable Values. Outstandingly remarkable values for Birch Creek are scenic, recreation, and fish populations and habitat.

Management actions that protect the naturalness of the landscape such as wilderness characteristics, protection of fish and wildlife habitats, protection of vegetation, and recreation management for more primitive experiences will help protect many of the possible Outstandingly Remarkable Values of river systems.

Alternative B is the only alternative where river segments are recommended for inclusion to the National Wild and Scenic Rivers System (NWSR). Big Windy Creek is recommended with Outstandingly Remarkable Values of scenic, geologic, and wildlife populations and habitat.

4.5.3.1.1. Alternative A (No Action)

No additional river segments are identified suitable for inclusion to the NWSR. Under this alternative, the BLM would not recommend that Congress designate any river segments. Birch Creek WSR would continue to be managed to protect water quality, free-flowing characteristics and important river values.

4.5.3.1.2. Alternative B

This is the only alternative where river segments are determined to be suitable for inclusion to the NWSR. The BLM would recommend that Congress designate one segment. This recommendation would influence the Congressional decision and increase the likelihood of permanent legislative protection. Decisions are evaluated for effect on identified Outstandingly Remarkable Values, free-flowing character and water quality.

Through the Wild and Scenic Rivers Inventory (Appendix E, *Wild and Scenic Rivers Inventory*) the BLM has determined which rivers and streams are suitable for inclusion in the NWSR. Within the Steese Subunit, Big Windy Creek was determined to be suitable with a classification of “wild.” Outstandingly remarkable values are scenic, geologic and wildlife. Any segments determined to be suitable must be managed for the protection of its Outstandingly Remarkable Values and free-flowing nature until such time as Congress acts upon the determination finding and either designates the river segment in the NWSR or removes it from consideration. If the segment is removed from consideration by Congress, the BLM would manage the segment according to the management provisions of the RMP. The determination of suitable is a policy determination.

Effects from Air and Atmospheric Values

Protection and enhancement of air resources that would continue to promote visually clear skies and maintain good visibility would protect outstandingly remarkable scenic values.

Effects from Cave and Karst Resources

Protection of cave resources located adjacent to or within the river corridor would protect outstandingly remarkable scenic and geologic values.

Effects from Cultural and Paleontological Resources

Surface-disturbing activities (e.g., site excavation) have the potential to directly and indirectly impact water quality, and indirectly impact outstandingly remarkable scenic, geologic and wildlife habitat values.

Effects from Soil, Vegetation, and Water Resources

Management of soil resources, vegetative communities, and watersheds for a properly functioning condition within riparian zones, uplands, wetlands and aquatic areas would directly and indirectly enhance water quality and outstandingly remarkable scenic and wildlife habitat values.

Effects from Visual Resources

“Wild” river segments would be managed as a VRM Class I with the objective to preserve the existing character of the landscape and provide for natural ecological changes. Very limited management activities may occur where the level of change to the characteristic landscape is very low and must not attract attention. This would protect outstandingly remarkable scenic values.

Effects from Wilderness Characteristics

The maintenance of wilderness characteristic would directly protect outstandingly remarkable scenic values, the free-flowing characteristics and water quality.

Effects from Wildland Fire Ecology and Management

Wildland fires have the potential to destroy or harm wildlife habitat and populations, affecting the outstandingly remarkable wildlife values.

Effects from Wildlife

Management of a naturally functioning ecosystem would directly and indirectly protect outstandingly remarkable scenic and wildlife populations and habitat values and enhance water quality.

Effects from Lands and Realty

Land use authorizations, such as leases and rights-of-way, could indirectly and directly impact outstandingly remarkable scenic, geologic and wildlife populations and habitat values, directly impact free-flowing characteristics, and indirectly impact water quality if authorized across or along the river segment.

Effects from Recreation

Big Windy Creek is located within the Primitive Wolf Creek RMZ. Minimal facilities development would occur within this RMZ. Currently, there are a few small groups of recreation users who visit the segment and visitation is expected to remain low due to the remoteness. Visitors to the area may impact outstandingly remarkable geologic and wildlife values by visiting the hot springs. Facilities may directly impact scenic quality and indirectly impact water quality, however they would be designed to blend with the surrounding landscape characteristics and to not adversely affect water quality.

Effects from Travel Management

Unrestricted non-motorized travel could directly impact outstandingly remarkable scenic values and water quality with the development of social travel routes. Restricted motorized travel could directly and indirectly impact water quality and outstandingly remarkable wildlife values by allowing motorized access to remote areas. Motorized use may directly impact outstandingly remarkable scenic values and indirectly impact outstandingly remarkable geologic values with the development of travel routes.

Effects from Special Designations

Designation of 927,000 acres as the Steese ACEC, with restrictions and limitations on resource development, would protect outstandingly remarkable scenic, geologic, and wildlife population and habitat values and indirectly enhance water quality due to limitations and restrictions to development.

Big Windy Creek, totaling 14 miles and 4,500 acres, would be recommended for designation to the NWSR. The designation of this river by Congress would provide for greater protection of overall river values and of outstanding remarkable river values specifically. The amount of protection is dependent on the classification of the river segment. Management of suitable rivers would be coordinated with the State of Alaska.

The management of Big Windy RNA would protect outstandingly remarkable scenic, geologic and wildlife populations and habitat values because of its designation as a right-of-way avoidance area, and prohibitions on mining, off-road vehicles, and camping. These management actions would also directly and indirectly enhance water quality.

Effects from Hazardous Materials

Environmental remediation activities such as the removal of surface or buried wastes from abandoned sites and removal of contaminated soils could directly and indirectly enhance water quality and outstandingly remarkable scenic and wildlife values depending on the location of these activities.

Effects from Subsistence

Harvest of subsistence resources such as timber and other forest products may directly and indirectly impact the outstandingly remarkable scenic and wildlife values if collection of these resources occurs within the river corridor.

4.5.3.1.3. Alternative C

Under Alternative C no additional rivers segments suitable for inclusion to the NWSR have been identified. The BLM would not recommend that Congress designate any additional river segments. Birch Creek would continue to be managed to protect water quality, free-flowing characteristics and identified Outstandingly Remarkable Values of scenic, recreation and fish populations and habitat.

4.5.3.1.4. Alternative D

Same as Alternative C.

4.5.3.1.5. Cumulative Impacts

Past, present and reasonably foreseeable actions that are relevant to Wild and Scenic Rivers management include mining, oil and gas development, increases in motorized use on both water and adjacent lands, utility and transportation rights-of-way, recreation use, travel management, and use restrictions to protect wildlife, fisheries and vegetative resources.

Cumulative effects will accrue from BLM management decisions in addition to activities on surrounding lands during and beyond the life of the plan. The land base surrounding Big Windy Creek is BLM. However, the Birch Creek watershed includes state land. State lands are generally subject to resource development activities which may have a direct impact on water quality and other river related values. Development of lands along waterways could have an indirect impact on other rivers by increasing the importance of river related values of free-flowing, water

quality, scenic, recreation, geologic, fish and wildlife habitats and populations, cultural and historic values on those other rivers.

Designation and management of ACECs and maintenance of wilderness characteristics, as well as measures to protect other resource values on adjacent federal lands would help protect river values. Proposed and current management in these areas would limit development and help maintain a more natural ecosystem with benefits to water quality and other river related values.

Protection of river related values including outstandingly remarkable scenic, recreation, and fish populations and habitat values along Birch Creek WSR would continue. No rivers on other federal lands in the subunit have been identified as having values of eligibility. Protection of river related values along the proposed addition of Big Windy Creek, with outstandingly remarkable scenic, geologic and wildlife values, would continue if designated by Congress. The BLM could implement other means to protect river values if these segments are not included in the system.

4.5.4. Social and Economic

4.5.4.1. Economics Steese Subunit

Summary of Effects

The largest economic effect in the Steese Subunit would be from mining. The proposed revocation of ANCSA 17(d)(1) withdrawals would result in the staking of new mining claims and additional suction dredging, and small- and large-scale placer mine operations in the subunit.

Employment associated with mining activity on BLM-managed lands in the Steese Subunit would be higher than in the Fortymile Subunit, about 36 full-time equivalent direct jobs under Alternative D. The effects would be the least under Alternative A and the greatest under Alternative D (Table 4.10, "Direct Employment and Income").

4.5.4.1.1. Effects Common to All Alternatives

In addition to the effects discussed as common to all subunits in section 4.3.3.1 the following effects would occur in the Steese Subunit.

There are no revenues to the State of Alaska or the federal government that would result from coal, or oil and gas exploration. Similarly, no revenues would result from locatable mineral exploration and mining.

The discussion on effects from locatable minerals in the following sections is based on models developed by Stebbins (2009). See section 4.4.4.1.2 Fortymile Subunit, Effects from Locatable Minerals for discussion of the Stebbins model, timeline for new claims, life of mines, and a background discussion of types of economic impacts.

4.5.4.1.2. Alternative A (No Action)

Effects would be limited to increase in currently allowed economic activities resulting from population growth.

Effects from Locatable Minerals

Alternative A would not allow new claims, as BLM lands are currently withdrawn from mineral entry. There are, however, existing mining operations on 7,000 acres of valid existing federal mining claims in the Steese Subunit. The following discussion for Alternative A is based on activities likely to occur on these existing claims. Mining activity is predicted to result in large and small-scale placer and suction dredge operations in the subunit.

Suction dredge mining results in the least economic effect of any mining method. Portable and inexpensive equipment is used. The model developed for suction dredge mining in all locations involves a crew of four (4) working 10 hours per day, seven days per week, 125 days per year. Based on one suction dredging operation, the current employment is two workers.

Small-scale placer mining uses a bulldozer, and excavator and a mobile wash plant to excavate and process gold-bearing gravel. In this model, a two-man crew works 12 hours per day, seven days per week, during a 130 day season. The camp includes one support person and a cook for a total of four workers. Current employment is 28 workers at seven operations.

Large-scale placer operations utilize excavation equipment larger than the small-scale model. In this model, two 2-man crews moving material; each work a 10-hour shift, seven days per week, during a 130 day season. Five additional employees, including a supervisor, skilled workers, and laborers; a total of nine workers are included in the model. As there are two current operations, the resulting employment is 18 workers.

Total current mining employment on BLM-managed lands in the subunit would be estimated at 48 part-year workers. Data prepared by the State of Alaska uses full-time equivalents. The full-time equivalent in the Steese Subunit would be approximately 17 workers, based on the Stebbins (2009) models.

Total employment by the Alaska minerals industry in 2008 was 3,392 full-time equivalent jobs (Szumigala et al., 2009). This indicates less than one percent of the industry employment on BLM-managed lands occurred at Steese operations. The DGGs reported the average monthly wage for mining in Alaska during 2010 at \$8,345. Steese operations accounted for 1.7 million dollars in wages, annualized.

4.5.4.1.3. Alternative B

Effects from Fluid Leasable Minerals (oil and gas)

Seismic exploration could occur in the Steese Subunit on high potential oil and gas lands, but is unlikely during the life of the plan. Roadless exploration, in the form of seismic surveys, would occur in the winter after the tundra is frozen. Summer field sampling and reconnaissance would occur in using helicopter support.

Adjacent private land or federal land managed by the U.S. Fish and Wildlife Service in the Yukon Flats Basin could have approximately 130 to 212 2D or 3D line miles shot every five years (USFWS 2008a). Initially, 2D seismic would be collected, followed by 3D to identify potential reservoirs. The number of line miles shot on BLM lands, including those in this subunit, would be less than 20 miles.

Employment and spending accruing to work occurring on BLM-managed lands would be very low. Table 4.14, "Estimated Employment from Seismic Surveys" shows the estimated effect of seismic survey in the Yukon Flats Basin, allowing the reader the perspective of seismic work in

the entire region. Jobs created during the seismic surveys include: Superintendent, surveyors, recording crew, and caterers. Professional and technical employment in interpretation of survey findings would also occur outside the planning area.

Table 4.14. Estimated Employment from Seismic Surveys

Estimated employment generated by seismic surveys (Annual Part- or Full-Time Jobs) ^a	Direct Jobs	Indirect and Induced Jobs	Total Jobs
Local Employment	30	3	33
Rest of Alaska	20–44	57	77–101
Total Statewide	50–74	60	110–134

^aSource: USFWS 2008a

Effects from Locatable Minerals

Under Alternative B, 45,000 acres would be opened to locatable mineral entry in the Steese Subunit and new mining claims could be staked.

Suction dredge mining would occur at the same level as Alternative A and no additional employment would result. Small-scale placer mining would increase by one to a total of eight operations. New employment would be four workers during a 125 day season. No additional large-scale placer operations would open, remaining at two in the subunit. No new employment would result.

Total new mining employment associated with BLM-managed lands in the Steese Subunit under Alternative B would be estimated at four-part year workers. The full-time equivalent in the would be less than two workers, based on the Stebbins (2009) models. The DGGS reported the average monthly wage for mining in Alaska during 2010 at \$8,345. New Steese operations would account for \$144,535 in wages, annualized.

Indirect and induced employment and income would also result from new mining. These would be higher than under the no-action alternative. See Table 4.10, “Direct Employment and Income” for Steese data and a comparison of all subunits and alternatives.

State of Alaska revenue from Mining License Tax and Corporate Income Tax would also be proportionally higher under this alternative.

4.5.4.1.4. Alternative C

Effects from Fluid Leasable Minerals

Economic effects related to oil and gas would be the same as under Alternative B.

Effects from Locatable Minerals

Under Alternative C, 285,000 acres in the Steese Subunit would be opened to locatable mineral entry and the staking of mining claims.

There would be an estimated nine suction dredging operations, an increase of eight over Alternatives A or B. Resulting in new employment of 16 part-year workers. Small-scale placer mining operations would increase by 11 to a total of 18 operations. New employment would be 44 workers, during a 130-day season. There would be a total of four large-scale placer operations. As there are two current operations, the resulting new employment would be 18 workers, during a 130-day season.

Total new mining employment in the Steese Subunit under Alternative B would be estimated at 66 part-year workers. The full-time equivalent would be approximately 24 workers, based on the Stebbins (2009) models. The DGGs reported the average monthly wage for mining in Alaska during 2010 at \$8,345. New Steese operations would account for over \$2.3 million in wages, annualized.

Indirect and induced employment and income would also result from new mining. These outputs would be higher for Alternative C than Alternative B. See Table 4.10, “Direct Employment and Income” for Steese data and comparison of all subunits and alternatives.

State of Alaska revenue from Mining License Tax and Corporate Income Tax would also be proportionally higher under this alternative and higher than under Alternative B.

4.5.4.1.5. Alternative D

Effects from Fluid Leasable Minerals

Economic effects related to oil and gas would be the same as under Alternatives B and C.

Effects from Locatable Minerals

Under Alternative D, 693,000 acres in the Steese Subunit would be opened to locatable mineral entry and staking of new mining claims.

The number of suction dredge operations would increase to 12, an increase of 11 over Alternatives A or B, and three more than Alternative C. Resulting new employment would be 22 workers, during the 125 day season. Small-scale placer mining operations would increase by 17, to a total of 24 operations. New employment would 68 workers during a 130 day season. The number large-scale placer operations would be the same as Alternative C, a total of four. The resulting new employment from larger placer mines would be 18 workers, for a 130-day season.

Total new mining employment in the Steese Subunit under Alternative B would be estimated at 108 part-year workers. The full-time equivalent in would be approximately 39 workers, based on the Stebbins (2009) models. The DGGs reported the average monthly wage for mining in Alaska during 2010 at \$8,345. New Steese operations would account for over \$3.8 million in wages, annualized.

Indirect and induced employment and income would also result from new mining. These outputs would be higher for Alternative D than Alternative B or C. Please refer to Table 4.10, “Direct Employment and Income” for Fortymile data and a comparison of all subunits and alternatives.

State of Alaska revenue from Mining License Tax and Corporate Income Tax would also be proportionally higher under this alternative and higher than under Alternative B or C.

4.5.4.2. Environmental Justice Steese Subunit

Summary of Effects

Effects to the environmental justice population in this subunit are expected to be low. Increased employment opportunity caused by recreation use, mining, or seismic survey activity could benefit environmental justice populations in communities including Circle and Central.

4.5.4.2.1. Effects Common to All Alternatives

There will be little or no economic effect resulting from BLM decisions on BLM resource management activities; forest products; leasable minerals including Coal, Geothermal, Coal Bed Natural Gas, Non-energy Leasables, and Oil Shale; renewable energy; and lands and realty (see section 4.4.4.2).

Recreation activities would be slightly higher due to population growth in the region. Economic effects to communities slightly higher.

4.5.4.2.2. Alternative A (No Action)

There would be no effects.

4.5.4.2.3. Alternative B

Seismic exploration for oil and gas, and mining locatable minerals may result in additional jobs and income to local residents in the environmental justice population. These effects will be very low. Refer to Table 4.10, “Direct Employment and Income” to see total direct employment and income for all alternatives.

4.5.4.2.4. Alternative C

Seismic exploration for oil and gas, and mining locatable minerals may result in additional jobs and income to local residents in the environmental justice population. These effects will be very low. Please refer to Table 4.10, “Direct Employment and Income” to see total direct employment and income for all alternatives.

4.5.4.2.5. Alternative D

Seismic exploration for oil and gas, and mining locatable minerals may result in additional jobs and income to local residents in the environmental justice population. These effects will be very low and apply only to the action alternatives. Please refer to Table 4.10, “Direct Employment and Income” to see total direct employment and income for all alternatives.

The number of Special Recreation Permits would be slightly higher under Alternative D than in any other alternative. Environmental justice effects to communities in the area may be positive if employment in guiding or associated activities accrue to local populations.

4.5.4.3. Social Conditions Steese Subunit

Summary of Effects

Most impacts to individuals and groups are minor to moderate in part because other opportunities exist for the activities within the planning area on nearby State of Alaska or a Native corporation lands. While it is possible for impacts for multiple resources to adversely affect individuals and groups in a cascading fashion, most communities exhibit sufficient resiliency to adapt to the changes. The only community where local concern was expressed about community viability before consideration of impacts was Central, and it was relayed that since the Circle Hot Springs

closed, the town has been in decline, and the school is one pupil from closing. The potential lack of this key component of social web is an indicator of impaired resiliency, and the community may have greater difficulty adapting to some impacts.

4.5.4.3.1. Effects Common to All Alternatives

The following programs would have minor net positive or negative effect to social conditions and are not analyzed further: Air, Cave and Karst Resources, Cultural and Paleontological Resources, Fish and Aquatic Species, Soil Resources, Special Status Species, Vegetative Communities, Visual Resources, Water Resources, Wilderness Characteristics, Wildland Fire Ecology and Management, Wildlife, Fluid and Solid Leasable Minerals, Salable Minerals, Recreation, Travel Management, and Special Designations. For further discussion, see Effects Common to All Alternatives in all Subunits.

Effects from Forest and Woodland Products

Few residents live close enough to public land for it to be a convenient source of firewood. One exception is Circle, however this land may be disposed of to consolidate BLM lands and activities. Given the other nearby sources, including recent fire-scorched trees, there is no significant impact to communities in the planning area.

Effects from Land and Realty

Withdrawals have limited mining activity with the planning area. To the extent that lands remain closed to mineral entry, mining will cease to be an aspect of public land use within the planning area. No remnant activities will occur on public land to give context to the various displays of the mining era. Reduced opportunities for participation at a lifestyle or recreational level will reduce individual well being, and community well being in Center if opportunities for mining are not available on other lands.

Effects from Locatable Minerals

Communities relying on placer mining, like Central, are less viable as mining activity decreases, unless some other economic activity replaces mining. Mining opportunities also exist on state land in the area.

Effects from Subsistence

Preventing or reducing placer mining may improve subsistence catches of some fish species. This will increase the sense of well being among populations targeting such species, and will increase food security if other food sources are displaced by wildland fire, climate change, or other factors.

4.5.4.3.2. Alternative A (No Action)

Effects from Land and Realty; Locatable Minerals

Effects of maintaining ANCSA 17(d)(1) withdrawals may be decreased mining activity, eroding the community character and well being of communities in the subunit, such as Central. The extent of activity will be determined by the mineral potential of the available lands.

4.5.4.3.3. Alternative B

Effects from Land and Realty; Locatable Minerals

Effects of lifting ANCSA 17(d)(1) withdrawals may be a minor increase in mining activity, enhancing the community character and well being of communities in the subunit, such as Central. The extent of activity will be determined by the mineral potential of the available lands. Since over four percent of the acreage in the subunit will be available to mining, federally qualified subsistence users, those that value resource protection, some recreationists, and perhaps other groups may experience some decline in quality of life either directly in their activities, or indirectly.

4.5.4.3.4. Alternative C

Effects from Land and Realty; Locatable Minerals

Effects of lifting ANCSA 17(d)(1) withdrawals may be increased mining activity and increased diversity of operations, enhancing the community character and well being of communities in the subunit, such as Central. The extent of activity will be determined by the mineral potential of the available lands. Increased activity would result in new employment of 66 seasonal workers and over \$2 million in personal income for the employees, providing a significant economic infusion to an area with few employment opportunities. That effect may result in an increased well being and sense of security for those employees and area merchants. The effects may include increased traffic, higher home prices, and other consequences that result in a decreased well being and quality of life for other members of the community. Since twenty-two percent of the acreage in the subunit will be available to mining, some groups may experience a more significant decline in quality of life either directly or indirectly. These include federally qualified subsistence users, those that value resource protection, some recreationists, and perhaps other groups.

4.5.4.3.5. Alternative D

Effects from Land and Realty; Locatable Minerals

Effects of lifting ANCSA 17(d)(1) withdrawals may be increased mining activity and increased diversity of operations, enhancing the community character and well being of some communities in the subunit, such as Central. The extent of activity will be determined by the mineral potential of the available lands. Increased activity would result in new employment of 108 workers and nearly \$4 million in personal income for the employees, providing a significant economic infusion to an area with few employment opportunities. That may result in an increased well being and sense of security for those employees and area merchants. The effects may include increased traffic, higher home prices, and other consequences that result in a decreased well being and quality of life for other members of the community. Since fifty-four percent of the acreage in the subunit will be available to mining, other groups such as federally qualified subsistence users, those that value resource protection, and some recreationists may experience a significant decline in quality of life either directly in their activities, or indirectly.

4.5.4.4. Subsistence Steese Subunit

Summary of Effects

Primary impacts on subsistence resources and uses would be from decisions on mineral development and travel management. Impacts include user conflicts, displacement of resources, and potential declines in resource availability due to disturbance in critical habitats or during critical times (e.g., calving periods). Alternative D, which allows the most latitude for OHV use, rights-of-way and mineral development, would have the highest negative impacts on subsistence. Alternative B, which limits use of OHV the most, and designates transportation corridors and right-of-way avoidance areas, would confer the highest levels of protection to subsistence resources and uses. Where permits for summer use of OHV are required, such as in Semi-Primitive and Backcountry Recreation Management Zones, residents participating in federal subsistence opportunities would need a permit for summer OHV use. The permit requirement would be considered a “reasonable regulation” under ANILCA Title VIII Section 811(b).

Recreation in the Steese Subunit is concentrated along the Birch Creek WSR and Pinnell Mountain Trail and throughout the subunit during hunting seasons. Impacts to subsistence resources and uses from recreation management would be the result of travel management prescriptions and are discussed under travel management.

Alternatives B–D include designation of the Steese ACEC to protect caribou calving and post-calving habitat and Dall sheep habitat. Although the size of the ACEC varies among alternatives, the additional protection of these habitats will benefit subsistence resources. Many resource decisions, such as those for soil, water, air, wildlife, Special Status Species, special designations, and fish, will benefit subsistence resources (see 4.3.4.5 Impacts Common to All Subunits Subsistence.)

Little or no subsistence fishing occurs on the BLM lands in the Steese Subunit. In general, land use activities permitted in the area, such as development of transportation corridors and mineral deposits, may affect water quality at downstream locations and fish spawning or rearing areas, indirectly impacting subsistence fisheries harvested off BLM-managed lands. Stipulations to mitigate impacts to water quality and fish spawning and rearing areas are attached to land use permits. Locatable mineral development opportunities vary among the alternatives and would be expected to contribute to indirect and cumulative impacts on fisheries resources. Few rights-of-way applications, other than those from the BLM, have been received over the past two decades and it is anticipated that few would be requested occur over the life of the plan.

Black and brown bear, caribou, moose, furbearers and small game are recognized by the Federal Subsistence Management Program as subsistence wildlife resources in the Steese Subunit. Lifetime use of these resources by federally qualified subsistence users is documented by Caulfield (1979, 1983). Birch Creek residents indicated a lifetime use of trapping and hunting furbearers within the Steese NCA in the lower North Fork of Preacher Creek and moose and bear hunting on lands near Circle. Lands surrounding Circle are a checker board of Native corporation and Native-selected. Selected lands around Circle are low priority and will likely revert to BLM management. Residents of Circle also use these lands around the village for harvest of wildlife and small game (Caulfield 1979). Residents of Fort Yukon also report harvest of subsistence mammal species in the Steese Subunit on lands around Circle (Sumida and Alexander 1985). Residents of the Central area are contemporary users of caribou on the South Steese NCA Unit. Little or no use of subsistence wildlife resources has been documented by other qualified users.

Some land use decisions under the alternatives will impact vegetative communities and indirectly impact subsistence fish, wildlife and vegetative resources harvested on and off BLM-managed lands. These are discussed under the alternatives below. Forest resources may also be impacted

however little or no subsistence use of wood or forest products occurs on BLM-managed lands in this subunit.

Subsistence resource availability and opportunity have declined in many areas across the planning area and subsistence use may increase in the subunit over the life of the plan.

Measures to mitigate the impacts of land use actions on subsistence resource would be attached as stipulations to authorizing documents. Based on the evaluation that follows, minimal impacts to subsistence resources or uses would occur from decisions in Alternatives A, B and C. Impacts to subsistence resources and uses from Alternative D could be significant. Alternative D would allow development of locatable minerals in portions of the current White Mountains caribou calving and postcalving habitat, historic Fortymile calving and postcalving habitat, and current migration habitat, and Dall sheep mineral lick areas and movement corridors. Alternative D also provides the least amount of protection to streams, some of which are classified as anadromous, and could impact downstream fish habitat, depending on the level of interest in developing locatable minerals.

4.5.4.4.1. Effects Common to All Alternatives

Effects from Forest and Woodland Products

Decisions for the management of forest and woodland products vary widely over the four alternatives. Alternative A best protects subsistence resources as no commercial use is permitted in the Steese NCA. Alternative D would have the greatest impact. However, little documented subsistence use of resources occurs in the subunit. Requests for free-use permits for personal use have been rare and no requests for free-use permits for subsistence harvest have been documented over the past 20 years. Timber within the area is not considered marketable due to the remote location of stands of suitable trees.

Commercial and personal use of timber would not be authorized in some parts of the SRMA in all alternatives. While prohibitions on commercial uses may benefit some subsistence resources, restrictions on personal use may impact local federally qualified subsistence users. Residents of Central and the surrounding area are the primary federally qualified subsistence users of timber, logs and firewood adjacent to the SRMA. Residents harvest most firewood off BLM lands within the old fires boundaries around Central, primarily along the highway northeast of the community (Pers. comm. Glanz 2009). Subsistence use of timber resources would be available through free-use permits on lands undesignated recreation lands, including lands surrounding Circle that are not conveyed.

No impacts to federally qualified subsistence users or resources are expected from the decisions in any alternatives.

Effects from Leasable minerals

Seismic exploration could occur on high potential oil and gas lands in the Steese Subunit. Minimal impacts are expected to occur from geophysical exploration. No fluid mineral leasing, exploratory drilling or development is expected to occur during the life of the plan.

No impacts will occur to subsistence uses or resources from exploration or development of coal or related activities in the Steese Subunit under any alternative. No coal development will occur in

the subunit because a decision for coal leasing is deferred under this plan. An amendment to the RMP would be required before coal leasing could be authorized.

Effects from Salable Minerals

Although the lands open to salable minerals varies by alternative, demand is not expected to vary. Impacts to subsistence are minimized through permit stipulations. Few mineral sales have been authorized in the past and few are anticipated in the future as ample sand and gravel is available on state lands. Under the action alternatives, ROPs would apply and include reclamation and other best management practices. Impacts to subsistence uses and resources would be minimal under all alternatives.

4.5.4.4.2. Alternative A (No Action)

Under the No Action Alternative, present land management practices and levels of resource used would continue in accordance with existing laws, regulations and policy. Land use activities would continue to be analyzed through the NEPA process and include ANILCA Title VIII Section 810 evaluations. Through these processes, appropriate stipulations would be developed to mitigate any impacts identified.

Effects from Lands and Realty

State lands within the boundaries of the Steese NCA have been identified for acquisition through exchange under this alternative. No adverse impacts to subsistence uses or resources are expected from this action. Management of subsistence resources and uses would become more consistent as land status is simplified. Consolidation of lands would reduce confusion over which regulations apply to which lands.

Four transportation corridors are identified in the Steese NCA. Rights-of-way would be constrained to these corridors if possible. Only one improvement has been made in the transportation corridors since signing of the existing ROD (BLM 1986a). Consolidation of rights-of-way would benefit subsistence resources and uses by protecting wildlife and fish habitat and vegetative communities. No impacts are expected from this alternative.

Effects from Leasable Minerals

All lands are withdrawn from fluid and solid leasable minerals and there are no existing leases. No impacts would occur under this alternative

Effects from Locatable Minerals

All lands are withdrawn from mineral entry. Activity is limited to valid existing claims that predate the withdrawals. An environmental assessment is completed for each operation. Stipulations are attached to authorizations and operators must comply with BLM reclamation standards, which minimize the impacts on subsistence resources.

Effects from Travel Management

Under Alternative A, most BLM lands would be open to cross-country use of OHV 1,500 pounds and less GVWR without a permit. For vehicles greater than 1,500 pounds GVWR off valid rights-of-way, a permit could be authorized for access to inholdings or with an authorized Plan of Operations. The Primitive Management Unit (Map 44), would be open to winter cross-country

use by snowmobile but closed to other motorized access off valid rights-of way without a permit. All non-motorized uses are allowed and aircraft use is unrestricted. The RNAs (3,000 acres) are closed to all motorized use.

User pioneered trails are more likely to occur where cross-country OHV use is allowed. User pioneered trails cause degradation of soils and vegetation, resulting in rutting, erosion and reduced water quality. Cross-country use would also have direct impacts on resource abundance, distribution and location, especially during periods of concentrated use of OHV, such as late summer and early fall hunting seasons. Impacts to subsistence resources and uses could become significant over the life of the plan if recreational use (including hunting) increases as projected (Chapter 4 Recreation).

4.5.4.4.3. Alternative B

Effects from Lands and Realty

Acquisition of lands within the Steese NCA, consolidation of scattered parcels around Circle, and disposal of lands identified for disposal will simplify land status and benefit management of subsistence resources and uses. No adverse impacts are expected from these actions.

Two transportation corridors are identified in Alternative B. The Steese ACEC, Mount Prindle RNA and Birch Creek WSR Corridor would be right-of-way avoidance areas, except where transportation corridors cross these areas. No adverse impacts are expected to subsistence resources or uses from these decisions.

Effects from Leasable Minerals

Approximately nine percent of the BLM lands within the Steese Subunit would be open to all leasable minerals under Alternative B. Nominations for lease sales would be analyzed through a new NEPA document. Seismic exploration could occur on high potential oil and gas lands during the life of the plan (Map 96). Geophysical exploration would require removal of trees from 10–20 miles of straight line transects, each 14 feet wide. The impact to subsistence resources would be minimal and to the extent possible, mitigated through the authorization of the action.

Effects from Locatable Minerals

Only nine percent of BLM lands would be open to locatable minerals. The locatable mineral potential is low for open areas (Maps 105 and 31). Same as Alternative A, an environmental assessment is completed for each operation. ROPs would include reclamation and other best management practices. Impacts to subsistence uses and resources would be minimal.

Effects from Travel Management

Under Alternative B, RNAs (3,000 acres) would be closed to the use of all OHVs. Travel management prescriptions on the remaining lands would be limited to cross-country winter use of snowmobiles 1,000 curb weight and less. Aircraft would be generally unrestricted. Use of any other OHV would require a permit, including use for subsistence purposes. Limits on use of OHV would in general protect subsistence resources and habitats and would be considered a benefit. Use of OHV by subsistence harvesters would require a permit in RNAs and for summer use in all other areas, and would be considered a reasonable regulation (ANILCA Section 810(b)).

In areas closed to motorized vehicles, federally qualified subsistence users, subject to reasonable regulation and with a free permit, can use snowmobiles or other means of surface transportation for subsistence purposes as allowed under ANILCA Section 811 (section 2.4.2.7 Travel Management).

4.5.4.4.4. Alternative C

Effects from Lands and Realty

Alternative C differs from Alternative B in that no right-of-way avoidance areas are identified. Impacts to subsistence are expected to be minimized through permit stipulations. Effects from changes in land tenure would be the same as Alternative B.

Effects from Leasable Minerals

Approximately twenty percent of BLM lands would be open to all leasable minerals under Alternative C. Although a larger area would be open to leasable minerals, effects would essentially be the same as Alternative B. Nominations for lease sales would be analyzed through a new NEPA document. Seismic exploration could occur on high potential oil and gas lands. Some high potential areas occur in the Preacher Creek area of the North Steese NCA Unit. Geophysical exploration would require removal of trees from 10–20 miles of straight line transects, each 14 feet wide. The impact to subsistence resources would be minimal and to the extent possible, mitigated through the authorization of the action.

Effects from Locatable Minerals

Approximately twenty percent of BLM lands would be open to locatable minerals under Alternative C. The mineral potential is high for most of the open areas (Maps 105 and 33). Demand for locatable minerals is expected to be high (approximately 15 small-scale placer mines anticipated). Operations would be analyzed and ROPs would include reclamation and other best management practices. Impacts to subsistence uses and resources would be minimal.

Effects from Travel Management

Alternative C differs from B in the location and size of the RMZs and that off-route travel for game retrieval would be allowed in some RMZs. Cross-country winter use of snowmobiles 1,000 curb weight and less would be allowed in all but the RNAs (3,000 acres). Summer use of OHV 1,000 pounds curb weight and less would be limited to existing trails in the undesignated recreation area and Middlecountry and Frontcountry RMZs, except for retrieval of game, which is allowed off trail. Larger OHVs, up to 10,000 pounds curb weight would be allowed on existing roads only. A permit or approved Plan of Operations would be required for all other use.

Limits on use of OHV would in general protect subsistence resources and habitats and would be considered a benefit. Provisions allowing game retrieval off trail may increase participation in hunts and impact subsistence opportunity, especially where competition for resources is high, such as for Fortymile caribou. Where permits are required, use of OHV by subsistence harvesters would also require a permit and would be considered a reasonable regulation. In areas closed to motorized vehicles, federally qualified subsistence users, subject to reasonable regulation and with a free permit, can use snowmobiles, motorboats, or other means of surface transportation for subsistence purposes as allowed under ANILCA Section 811 (see section 2.4.2.7 Travel

Management). ANILCA Section 810(b). Impacts to subsistence would be minimal because little harvest of subsistence resources occurs in the subunit.

4.5.4.4.5. Alternative D

Impacts to subsistence resources and uses from Alternative D could be significant. Alternative D would allow development of locatable minerals in portions of the current White Mountains caribou calving and postcalving habitat, historic Fortymile calving and postcalving habitat, and current migration habitat, and Dall sheep mineral lick areas and movement corridors. Alternative D also provides the least amount of protection to streams, some of which are classified as anadromous, and could impact downstream fish habitat, depending on the level of interest in developing locatable minerals.

Effects from Lands and Realty

Alternative D differs from other alternatives in that there are no designated transportation corridors or right-of-way avoidance areas. Impacts to subsistence are expected to be minimized through permit stipulations. Effects from changes in land tenure would be the same as Alternative B.

Effects from Leasable Minerals

Approximately fifty-four percent of BLM lands would be open to all leasable minerals under Alternative D. Impacts would be essentially the same as Alternative C.

Effects from Locatable Minerals

Approximately fifty-four percent of BLM lands would be open to locatable minerals under Alternative D. The mineral potential is medium to high for most of the open areas (Maps 35 and 105). Demand for locatable minerals is expected to be high.

Impacts to important subsistence wildlife resources in the subunit, primarily White Mountains and Fortymile caribou, include changes in migration patterns and loss of habitat through fragmentation (roads) or direct disturbance (section 4.5.1.7 Wildlife). Mining of new as well as existing claims would impact fisheries within the subunit and downstream beyond the life of the plan (section 4.5.1.2). Impacts to subsistence uses and resources from locatable minerals could be significant, depending on interest in new developments. Operations would be analyzed and ROPs would include reclamation and other stipulations to help minimize impacts to subsistence use and resources.

Effects from Travel Management

This alternative differs from Alternatives B and C in the location and size of the RMZs (Map 56) and that cross-country summer use of OHV 1,000 curb weight and less would be allowed in the undesignated recreation area and Middlecountry and Frontcountry RMZs. Although Alternative D would allow for the greatest latitude in OHV use by subsistence and other users, it would also have the highest potential for conflicts among resource uses.

User pioneered trails are more likely to occur where cross-country OHV use is allowed. User pioneered trails cause degradation of soils and vegetation, resulting in rutting, erosion and reduced water quality. Cross-country use would also have direct impacts on resource abundance, distribution and location, especially during periods of concentrated use of OHV, such as late summer and early fall hunting seasons. Impacts to subsistence resources and uses could become

significant over the life of the plan if recreational use (including hunting) increases as projected (Chapter 4 Recreation).

Impacts to subsistence could be felt on and off federal lands if increased access to resources resulted in fewer opportunities for federally qualified subsistence users. For example, as opportunities to harvest caribou decrease across the state, participation in general hunts accessible by road, trails and cross-country by OHV, especially those hunts with few restrictions (registration permit vs drawing), receive higher participation. Hunts in these areas close early, often within days of opening and before caribou are accessible to rural communities. Where it would be determined that OHVs are causing or would cause considerable adverse impacts, the Authorized Officer can close or restrict use in an area. Other than this action, except where stipulations can be attached to permitted uses, mitigation of impacts to subsistence from OHV use would be outside the scope of management decisions in the plan.

4.5.4.4.6. Cumulative Effects

Use of the area has increased substantially since the Steese NCA was designated in 1980. Demand for recreational use is anticipated to continue increasing over the life of the plan as population of the state increases and as technological advancements in recreational equipment occur. Demand for resources important to subsistence use in the subunit may increase as fish and wildlife resources dwindle in other portions of the area and state. Conflicts between subsistence and other hunters and other resource uses may increase.

Development off BLM-managed lands, such as mines on state lands within the Fortymile caribou herd calving/postcalving area, may impact subsistence opportunity in the Steese Subunit if caribou population numbers or movements are altered as a result of this and similar activities.

The cumulative case may result in a reasonably foreseeable and significant restriction on subsistence use within the subunit. If significant development activity occurs within the migration or other important habitats of wildlife. (Appendix J, *ANILCA Section 810 Analysis* section J.2.2.5 Steese Cumulative Case).

4.6. Impacts Specific to the Upper Black River Subunit

4.6.1. Resources

4.6.1.1. Cultural and Paleontological Resources Upper Black River Subunit

Summary of Effects

See section 4.3.1.3 Effects Common to All Alternatives, Impacts Common to All Subunits.

4.6.1.1.1. Effects Common to All Alternatives

In addition to those resources, resources uses, and programs listed as having no potential effects to cultural and paleontological resources in section 4.3.1.3, the following programs would also have no effects under all alternatives in the Upper Black River Subunit: Locatable Minerals and Recreation.

In terms of locatable minerals, all lands are presently withdrawn, and there are no existing mining claims. As a result, there are presently no effects to cultural and paleontological resources. In Alternative B, the entire subunit, or 2,361,000 acres, would remain closed. In Alternative C and Alternative D, the entire 2,361,000 acres in the subunit would be opened to mineral entry. Typically, locatable mineral mining would have the potential to directly and adversely impact cultural and paleontological resources through not only the mining itself and the construction of new access roads, but also indirectly by opening up new, previously isolated areas to other public land users. However, assumptions for locatable minerals for all alternatives in the subunit indicate that no mining activity would occur. This equates to no acres of disturbed ground and no new access roads. In sum, locatable mineral mining would not impact cultural and paleontological resources in the Upper Black River Subunit over the life of the plan.

The subunit is extremely remote, and ongoing recreational uses of BLM-managed lands consist primarily of subsistence or casual recreational use. There are no plans to change this present situation in any of the alternatives. Therefore, there would be no potential impacts to cultural and paleontological resources from the recreation program in this subunit.

4.6.1.1.2. Alternative A (No Action)

Effects From Travel Management

There are no OHV designations in place and the use of motorized vehicles, mechanized equipment, water craft, and aircraft is unrestricted. With no restrictions on the size, location, and seasonality of equipment used in this subunit, the potential for adversely effecting cultural and paleontological resources exists.

4.6.1.1.3. Alternative B

Effects From Travel Management

Cross-country winter use (October 15 through April 30) of snowmobiles weighing 1,500 curb weight and less would be allowed throughout the entire subunit. Cross-country (year round)

use of vehicles weighing 1,500 curb weight and less would be allowed outside of the proposed Salmon Fork ACEC (621,000 acres).

With advances in recreational vehicle technology, the Upper Black River Subunit could experience an increased level of land use and activity participation related to OHVs and access for subsistence uses. However, this increase would most likely be limited due to the features of topography, soils, vegetation, permafrost, lack of any defined trails, and overall remoteness of the area. There would likely be less direct adverse effects to cultural and paleontological resources in Alternative B relative to Alternative A. The potential for direct effects to cultural resources exists in Alternative B, as OHV use in the area would likely concentrate on higher, better drained areas. Archaeological surveys throughout the subunit indicate a predominance of prehistoric archaeological sites in just such areas that would be favored by overland OHV users. There would be no likely impact to paleontological resources by this alternative.

4.6.1.1.4. Alternative C

Effects From Travel Management

The potential impacts to cultural and paleontological resources would be the same as Alternative B, excepting the potential to damage cultural resources would be greater because no lands are closed to cross-country (year-round) use of vehicles weighing 1,500 curb weight and less.

4.6.1.1.5. Alternative D

Effects From Travel Management

Same as Alternative C.

4.6.1.2. Fish and Aquatic Species Upper Black River Subunit

Summary of Effects

Fish and aquatic resources would be primarily affected by surface-disturbing activities which alter stream channels, remove or damage riparian vegetation, or result in soil erosion and sedimentation to fish and aquatic habitat. The level of impact would depend on the success and adequacy of protective measures. Few surface-disturbing activities are expected in this subunit under any alternative due to the lack of access and limited mineral potential. However, the Salmon Fork Black River contains very high fishery resources, meets the importance and relevance criteria as an ACEC for fishery values, and is open to locatables under Alternatives C and D. Designation of the Salmon Fork ACEC under Alternatives B, C, and D would provide additional protection of fish habitat.

Table 4.15. Stream Miles and Acres Open to Locatable Mineral Entry by Alternative, Upper Black River Subunit

UPPER BLACK RIVER SUBUNIT (BLM-managed lands)	ALTERNATIVES			
	A	B	C	D
Stream miles	4,144	4,144	4,144	4,144
Stream miles open to locatables (proposed)	0	0	4,144	4,144
Stream miles open to locatables (proposed) plus miles within current valid federal claims	0	0	4,144	4,144

UPPER BLACK RIVER SUBUNIT (BLM-managed lands)	ALTERNATIVES			
	A	B	C	D
Stream miles within RCAs in areas open to locatables (proposed)	0	0	559 (14%)	360 (9%)
Stream miles outside RCAs in areas open to locatables (proposed)	0	0	3,576 (86%)	3,775 (91%)
Acres open to locatables (proposed)	0	0	2.4 million	2.4 million
Acres open to locatables (proposed) plus miles within current valid federal claims	0	0	2.4 million	2.4 million
Anticipated stream gravel disturbance by suction dredging during life of plan measured in cubic yards	0	0	0	0
Potential impacts to fish and aquatic habitat (1-3, 3= greatest)	1	1	2	3

4.6.1.2.1. Alternative A (No Action)

Effects from Leasable Minerals

The entire subunit is currently withdrawn from mineral leasing through PLOs issued under ANCSA 17(d)(1). There are no existing federal mineral leases. Under this alternative, impacts to fisheries and aquatic resources would be non-existent.

Effects from Locatable Minerals

The entire subunit is currently withdrawn from locatable mineral entry through PLOs issued under ANCSA 17(d)(1). There are no existing federal mining claims. Under this alternative, impacts to fisheries and aquatic resources would be non-existent.

Effects from Recreation

There is no existing land use plan for the Upper Black River Subunit. The subunit is managed as an extensive recreation management area, which includes managing in a custodial manner and providing for visitor health and safety, reducing user conflicts, visitor satisfaction, and preventing resource damage. There are no OHV designations in place and the use of motorized vehicles and mechanized equipment, motorized water craft, and aircraft is unrestricted. The subunit is extremely remote and ongoing uses of BLM-managed lands consist primarily of subsistence or casual recreational use. There are no known impacts to fish and aquatic habitat from recreation in this subunit. Given the remote location and low number of people living in or adjacent to this subunit the impacts would likely be minor or nonexistent. Recreation will be managed the same for Alternatives A, B, C, and D and therefore the potential impacts to fish and aquatic habitat for all Alternatives would be the same.

Effects from Travel Management

There are no OHV designations in place and the use of motorized vehicles and mechanized equipment, motorized water craft, and aircraft is unrestricted. Impacts from OHVs would likely be minimal given the remote location, limited use, and limited number of “summer trails” within the subunit. Most travel within the subunit is by boat, snowmobile, or aircraft, which generally has little impact on fish and aquatic habitat.

4.6.1.2.2. Alternative B

Effects from Leasable Minerals

The effects would be the same as in Alternative A

Effects from Locatable Minerals

The effects would be the same as in Alternative A.

Effects from Recreation

The effects would be the same as in Alternative A.

Effects from Travel Management

This alternative allows cross-country use of OHVs weighing 1,500 pounds curb weight year round, except in the Salmon Fork ACEC. Impacts from OHVs would likely be minimal given the remote location and limited use and limited number of “summer trails” within the subunit. Most travel within the subunit is by boat, snowmobile, or aircraft which generally has little impact on fish and aquatic habitat. Alternative B would provide more protection to fish and aquatic habitat than Alternatives A, C, or D.

Effects from Special Designations

Under Alternative B, 621,000 acres within the Salmon Fork watershed would be designated as the Salmon Fork ACEC. The Salmon Fork Black River contains high-value fishery resources and is the main reason for the ACEC designation. The ACEC would remain closed to locatable minerals, leasable minerals, and salable minerals. Fish and aquatic habitats benefit in areas closed to mineral entry, because the habitat generally remains intact.

The Salmon Fork Black River (52 miles) would be recommended as suitable for designation in the National Wild and Scenic Rivers System. The river corridor would be closed to mineral leasing and location. Fish and aquatic habitats benefit in areas closed to mineral entry, because the habitat generally remains intact. Alternative B would provide the greatest protection to fish and aquatic habitat, as compared to Alternatives A, C, and D.

4.6.1.2.3. Alternative C

Effects from Leasable Minerals

The Salmon Fork Black River ACEC (621,000 acres) would be closed to oil and gas leasing while the remainder of the subunit would be open. Leasing would not occur without further NEPA analysis. Interest from industry is expected to be limited due to the lack of BLM-managed lands in high potential areas. Seismic exploration would be allowed during winter months after the tundra is frozen. If seismic exploration does occur, it would likely occur in high potential areas, but is unlikely during the life of the plan. Given those assumptions, impacts to fisheries and aquatic habitat would be minor to non-existent.

Potential threats to overwintering fish from seismic surveys in the planning area would primarily stem from: 1) stress associated with acoustic energy pulses transmitted into the ground directly over overwintering pools, and 2) physical damage to overwintering habitat caused by seismic

vehicles. Large overwintering pools might allow fish to flee the immediate area of intense stress where fish occupying small pools might not have that option. Depending on proximity, adult fish could suffer no more than temporary discomfort where intense acoustical pulses could be lethal to juveniles. Given that overwintering habitat represents a small percentage of the planning area, it is unlikely that seismic transmissions would occur directly over overwintering sites with any degree of regularity. Furthermore, seismic crews could avoid known overwintering areas. Overall, any affects to overwintering fish caused by winter seismic surveys would be localized and would likely to have little effect on fish populations within the planning area.

Effects from Locatable Minerals

Alternative C is substantially different from Alternatives A and B because in Alternative C the entire subunit (2.4 million acres) and 4,144 miles of stream would be open to locatable mineral entry. This includes 559 miles of stream (fourteen percent) within RCAs on the Salmon Fork Black and Kandik Rivers and over 1,000 miles within the Salmon Fork Black River ACEC. There are 582 miles of stream within RCAs in areas open to locatables in the entire planning area and ninety-six percent of them occur in this subunit. Protection of fish and aquatic habitat in eighty-six percent of the stream miles would rely on the current regulations, reclamation requirements and ROPs outlined in this plan, and mitigation measures developed during project-specific NEPA analysis. Mineral potential within the subunit is considered low with no foreseeable development for locatable minerals.

The proposed Salmon Fork Black River ACEC was nominated by the public for various resource values including fisheries. BLM evaluated the ACEC for fishery values and determined it met both the relevance and importance criteria. The maintenance of these high-value fishery resources would rely upon the higher level of reclamation previously described (Chapter 2, Fish and Aquatic Species) for RCAs and ACECs. As previously mentioned, placer mining has resulted in unavoidable short- and long-term adverse impacts to fish and aquatic resources in the past and therefore would likely have similar results within the proposed ACEC.

If development did occur, based on the amount of stream miles and acres open to potential disturbance, impacts to fish and aquatic resources may be considered moderate and short-term (5 to 10 years) within the RCAs and ACEC and moderate and long-term (10 to 20 years) outside of RCAs and the ACEC. Potential impacts may result in decreased levels of fish populations and habitat at the local level. Alternative C would provide less protection to fish and aquatic habitat than Alternatives A and B and more protection than Alternative D.

Effects from Recreation

The effects would be the same as in Alternative A.

Effects from Travel Management

This alternative allows the cross-country use of OHVs weighing 1,500 pounds curb weight and less year round within the entire subunit, including the Salmon Fork ACEC. Impacts from OHVs would likely be minimal given the remote location, limited use, and limited number of “summer trails” within the subunit. The Salmon Fork ACEC designation is largely due to the high-value fishery resources found there. Although the area is very remote and OHV use is expected to be minimal, cross-country travel could potentially impact this high-value fishery. Closing the ACEC to cross-country OHV travel during summer months would ensure this high-value resource

remains intact and sustainable. Alternative C would provide more protection to fish and aquatic habitat than Alternative A, but less than Alternative B.

Effects from Special Designations

Alternative C would designate 621,000 acres as the Salmon Fork ACEC. In this Alternative, the ACEC would be open to locatables. The travel management and minerals decisions in the ACEC are also less restrictive than in Alternative B providing less protection to fish and aquatic habitat. Fish and aquatic habitat benefit from this alternative, but to a much lesser degree than in Alternative B because of potential disturbance.

4.6.1.2.4. Alternative D

Effects from Fluid Leasable Minerals

Impacts to fish and aquatic habitat would be similar to those in Alternative C, but Alternative D would have fewer acres subject to minor constraints. Alternative D would have the greatest potential impacts to fish and aquatic resources.

Effects from Locatable Minerals

The effects are the same as Alternative C, with the exception that Alternative D has 200 fewer stream miles within RCAs. This is simply because there are fewer RCAs in Alternative D, the number of stream miles open to locatables are the same as Alternative C.

Impacts to fish and aquatic habitat would be the greatest in Alternative D, because there are 200 more miles of stream (fish and aquatic habitat) that would not benefit from the higher reclamation standards required in RCAs and ACECs.

Effects from Recreation

The effects are the same as Alternative A.

Effects from Travel Management

The effects are the same as Alternative C.

Effects from Special Designations

The minerals decisions in the Salmon Fork ACEC (621,000 acres) are even less restrictive than in Alternative C, providing less protection to fish and aquatic habitat. In this alternative the ACEC would be open to salable minerals and mineral leasing subject to minor constraints. High-value fish and aquatic habitats within the proposed ACEC would rely on the higher reclamation standards for ACECs. Fish and aquatic habitat would benefit the least from Alternative D, as compared to Alternatives B and C.

4.6.1.3. Invasive Species Upper Black River Subunit

Summary of Effects

The Upper Black River Subunit is extremely remote. Current uses of BLM lands consist primarily of subsistence and casual recreation use. Impacts and prevention of NIS being introduced and

spread in the planning area were discussed in section 4.3.1.5 of this chapter and measures include outreach and education of applicants and recreational and other users. EDRR and inventory and monitoring will further halt the introduction and spread of NIS.

Prevention of the introduction of NIP is the focus of NIS management in the Upper Black River Subunit. Natural and human caused disturbances create favorable conditions for NIP to become established when seed is introduced. NIP can thrive in marginal habitats, such as compacted and dry soils or where canopy cover has been removed. Potential impacts to NIS management in the Upper Black River Subunit are expected to be minimal because the area is remote and few activities conducive to introduction and spread of NIS are expected to occur over the life of the plan.

4.6.1.3.1. Effects Common to All Alternatives

Effects from Forest and Woodland Products

Although management decisions for harvest of timber and forest products varies slightly by alternative in the Upper Black River Subunit, impacts to NIS management are expected to be minimal under all alternatives. Personal use of timber or forest products would be from residents of the subunit, which reduces the potential for NIS to be introduced. Although some alternatives close portions of the subunit to commercial timber sales, these closures would have little effect. Demand for commercial forest products and timber would be minimal to nonexistent because of the remoteness of the area and lack of access. Timber in this area is not considered marketable and it is highly unlikely that a commercial sale would occur under any alternative over the life of the plan.

Effects from Lands and Realty

Most lands and realty actions result in ground disturbance, which increases the potential for NIP to become established. Vehicles and equipment used for construction and maintenance in rights-of-way or site development can import NIS, including seeds and all developmental stages of invertebrate pests, to the disturbed area. The potential for introduction and spread of NIS from these actions, if they occurred, would be expected to be significant. Impacts would be mitigated to the extent possible through permit stipulations and education and outreach efforts directed at applicants. However, there are no roads on BLM lands and few applications for land use authorizations are anticipated under any alternative.

Effects from Salable Minerals

The primary impacts from salable minerals are introduction of plants from contaminated equipment or movement of seeds in contaminated gravel. Although management decisions for salable minerals vary slightly by alternative, impacts to NIP management are expected to be minimal under all alternatives. Alternative B would close the Salmon Fork ACEC to salable minerals. This closure would have no effect because no demand for salable minerals is anticipated over the life of the plan, regardless of alternative. In the highly unlikely event that an application for a mineral sale was received and approved, stipulations attached to the permit would include reclamation and other best management practices to minimize impacts from NIP. Monitoring and EDRR efforts would be costly but would further reduce the potential for NIP to become established. As discussed in section 4.3.1.5 Impacts Common to All Subunits, a weed-free gravel certification program is being developed in Alaska, further reducing the risks of introduction of non-native invasive plants from salable minerals.

Effects from Recreation

Recreation on BLM lands in the subunit would be managed as not designated under all alternatives. Recreation within an area without a special designation for recreation is managed as generally unstructured, with no identifiable market demand for development of infrastructure. Recreation use in the area is considered casual and expected to remain so over the life of the plan. Recreation management on all BLM lands promotes “Leave No Trace” and “Tread Lightly” use practices, which enhance the prevention of NIS introduction from recreational activities. No impacts to NIS management would be expected from recreational use in the area.

Effects from Travel Management

General impacts from Travel Management are discussed in section 4.3.1.5.1. Alternatives for travel management include a range of limits on OHV weight restrictions and cross-country summer use. Permits would be required for any OHV over 1,500 pounds curb weight. Limitations on OHV use would help prevent the introduction of NIS and aid EDRR efforts by concentrating use and reducing disturbance to native vegetation. Permitting use would provide opportunities to educated users on the threats to habitats from NIS and prevention measures they can take (use and site-specific mitigation).

Use of motorized boats would be unrestricted. Boats and other watercraft may harbor NIS that may be dislodged and spread to new areas. EDRR, outreach and education would help prevent the introduction of NIS from motorized boats.

Aircraft use would be unrestricted with provisions to minimize clearing. Formal improvements of airstrips would be by permit only. NIS, particularly plant seeds and aquatic invertebrates, can be transported by aircraft from infestations at urban airstrips or float ponds and dropped in remote areas on gravel bars, benches and ponds. Outreach and education targeting recreational users, including pilots, would help reduce introduction of NIS.

OHV and most other travel is expected to be local and mostly subsistence use related. Some use by aircraft would be expected, mostly during state hunting and fishing seasons. Impacts to NIS from travel management decisions under all alternatives would be minimal.

4.6.1.3.2. Alternative A (No Action)

Under the No Action Alternative, present land management practices and levels of resource used would continue in accordance with existing laws, regulations, and policy. Land use activities would continue to be analyzed through the NEPA process. Through these processes, appropriate stipulations would be developed to mitigate any impacts to NIS that would be identified.

OHV use is unrestricted in the subunit. No recreation management, RNA, ACEC, or WSR designations exist. The subunit is extremely remote and few to no land use activities occur that create disturbance to vegetative communities.

Effects from Lands and Realty

There would be no effects to NIS management from changes in land tenure, as no lands are identified for disposal or acquisition.

Most lands and realty actions result in ground disturbance, which increases the potential for NIP to become established. Vehicles and equipment used for construction and maintenance

in rights-of-way or site development can import NIS to the disturbed area. The potential for introduction and spread of NIS from these actions, if they occurred, would be expected to be significant. Impacts would be mitigated to the extent possible through permit stipulations and education and outreach efforts directed at applicants. Under Alternative A, land use authorizations would be considered throughout the subunit. Few requests for land use authorizations would be anticipated, since no right-of-way permits have been requested in the past and the area would remain withdrawn to leasable and locatable minerals.

Effects from Leasable and Locatable Minerals

The entire subunit is withdrawn from mineral entry and leasing. There are no existing mining claims or leases, thus there would be no impacts from leasable or locatable minerals.

4.6.1.3.3. Alternative B

Effects from Lands and Realty

Under Alternative B, private inholdings in the Salmon Fork ACEC could be acquired from willing sellers. Parcels intermingled with Native village lands around Circle would be considered for acquisition or disposal, including exchange. Consolidation of scattered parcels would simplify management of NIS. No adverse impacts would be expected from these actions.

The Salmon Fork ACEC would be a right-of-way avoidance area. This would reduce or eliminate ground disturbance and fragmentation of habitat from construction and maintenance activities. Requests for rights-of-way would be considered at the project level, allowing for mitigation of impacts to NIS management. Monitoring for NIP, which would be of most concern for realty actions, and EDRR efforts may also be employed to mitigate impacts. However, few requests for rights-of-way would be expected due to the remoteness of the ACEC and the lack of roads in the subunit. Little or no adverse impacts would be anticipated from these decisions.

Effects from Leasable and Locatable Minerals

The entire subunit (2,361,000 acres) would remain closed to leasable and locatable minerals. Same as Alternative A, there would be no impacts.

4.6.1.3.4. Alternative C

Effects from Lands and Realty

Effects from land tenure decisions would be the same as Alternative B.

No right-of-way avoidance areas would be designated under Alternative C, resulting in a slightly higher potential for impacts than in Alternative B. Requests for rights-of-way would be considered at the project level, allowing for mitigation of impacts to NIP in particular. Few requests for ROW authorizations would be expected. Little or no adverse impacts to NIP from these decisions are anticipated. Monitoring for NIP and EDRR efforts may be employed to mitigate impacts. Effects from land use authorizations would be similar to Alternative A.

Effects from Leasable and Locatable Minerals

All BLM lands would be open to all locatable minerals under Alternative C, including the 621,000 acres of the Salmon Fork ACEC. Mining operations would be analyzed on a project-specific basis

and stipulations would include reclamation and other best management practices to minimize impacts from NIS. Any operation under 4.4 acres would be a Notice level operation unless they occur in the ACEC, in which case a Plan of Operations is required under 3809.10. Monitoring and EDRR efforts would be costly, but would further reduce the potential for NIP to become established. The locatable mineral potential in the subunit is low and no locatable mineral exploration or development is anticipated, thus little or no impacts would be anticipated.

Suction dredging could occur with a notice level operation however the reasonably foreseeable development scenario prediction is that no suction dredge operations or casual-use level suction dredging will occur in the Upper Black River planning unit.

The ACEC will be closed to leasable minerals, consistent with maintaining wilderness characteristics. The remaining 1,740,000 acres would be open. No lease sales are anticipated in the remaining area. In the unlikely event that an area was nominated for a lease sale, the effects would be analyzed under a new NEPA document. Seismic exploration could occur on high potential oil and gas lands near Circle (Map 96). Geophysical exploration would require removal of trees in 14 foot wide straight line transects for 10–20 miles. Exploration will be limited to winter with requirements on snow and ground frost depths, which will protect vegetation. Compaction of vegetation and soils and removal of canopy cover to conduct exploration may result in conditions favorable to NIP becoming established if seed is introduced. NIS are more likely to be introduced in the Circle area than other parts of the subunit because these lands are less remote and have high potential for oil and gas. Impacts to NIS management would be minimal and to the extent possible mitigated through the permitting process.

4.6.1.3.5. Alternative D

Effects from Lands and Realty

Effects from land tenure decisions would be the same as Alternative B. Effects from land use authorizations would be the same as Alternative C.

Effects from Leasable and Locatable Minerals

All BLM lands would be open to leasable minerals under Alternative D, some subject to minor constraints. Although this alternative opens the Salmon Fork ACEC to leasable minerals, due to the low oil and gas potential, lack of access, and remoteness of the area no exploration or development is anticipated. Impacts would essentially be the same as Alternative C.

All BLM lands would be open to locatable minerals under Alternative D. Impacts would essentially be the same as Alternative C.

4.6.1.3.6. Cumulative Effects

The effects of past, present and foreseeable future actions in the Upper Black River Subunit are not likely to cumulatively impact NIS introduction and spread in the subunit. The remoteness of the area, lack of overland access, and costs of developing resources, other than those that would be used by local residents in or adjacent to the subunit, render it unlikely that locatable, leasable, or salable mineral or commercial forest sales would occur. Rights-of-way development would be driven by resource development. No proposed exploration, development, access or other

rights-of-way actions are currently under consideration on the BLM lands in the subunit. No new proposals are expected with the possible exception of oil and gas exploration.

With increased pressures from growing populations and advances in recreational vehicle technology, the Upper Black River Subunit may experience growth in recreation related land use and activity. If this occurs, the need for additional trails and mechanisms for managing these trails could become necessary. However, growth of OHV use would be limited as the subunit is inaccessible from existing roads and highways, is located north and east of the Yukon River, consists of terrain that is generally not suitable for summer OHV use, and is bordered by National Park Service lands on the south and National Wildlife Refuge lands on the north. The Yukon River is a barrier to summer access by OHV, and use of OHV on Yukon-Charley Rivers National Preserve and Yukon Flats NWR is limited.

4.6.1.4. Soil and Water Resources Upper Black River Subunit

Summary of Effects

Since much of the Upper Black subunit is underlain by permafrost, relatively minor surface disturbances can lead to long-term adverse impacts to soil and water resources. A variety of resources, resource uses, or programs outlined in the action alternatives protect soil and water resources including proposed riparian conservation areas to protect fish and aquatic species habitat, designation of the Salmon Fork ACEC, lands managed for wilderness character, and weight restrictions for OHVs; winter snowmobile use limited to 1,000 pounds or less curb weight and summer OHV use limited to 1,500 pounds or less curb weight.

Surface disturbance activities associated with lands and realty, minerals development, recreation development, and increased OHV travel would likely result in varied adverse impacts to soil and water resources. However, because of the remote nature and low mineral potential of the Black River Subunit, substantial development during the life of this plan is unlikely. In general, the potential for adverse impacts increases sequentially from Alternative B to Alternative C to Alternative D. The impacts associated with Alternative A vary by program, but would generally be similar to Alternative C. Appropriate stipulations and ROPs for soil and water resources would be implemented to ensure that long-term impacts would be minimized or avoided under all alternatives.

4.6.1.4.1. Alternative A (No Action)

Effects from Locatable Minerals

The Upper Black Subunit is closed to locatable mineral entry and there are no existing federal mining claims. There would be no effects from locatable minerals.

Effects from Recreation

There are no Recreation Management designations for the Black River Subunit. The subunit is extremely remote and ongoing uses of BLM lands consist primarily of subsistence or casual recreational use. Past impacts to soil and water resources have been low and future impacts are expected to be minimal under Alternative A.

Effects from Travel Management

There are no OHV area designations in place and the use of motorized vehicles, mechanized equipment, water craft, and aircraft is unrestricted. Alternative A could result in future detrimental impacts to soil resources and watersheds from proliferation of user-created trails, subsequent soil erosion, and increased siltation in streams. However, because of the remote location and lack of access, impacts to soils and water resources are expected to be minimal.

4.6.1.4.2. Alternative B

Effects from Locatable Minerals

The entire subunit, 2,361,000 acres would be closed to locatable mineral entry.

Effects from Recreation

There are no designated recreation management zones or areas for the Black River subunit. .

Effects from Travel Management

Seasonal travel restrictions and OHV weight restrictions would reduce the amount of surface disturbance to soil and water resources.

4.6.1.4.3. Alternative C

Effects from Locatable Minerals

The Salmon Fork ACEC (621,000 acres) would be open to locatable mineral entry and the remainder of the subunit, 1,740,000 acres would be open to mineral entry. However no mining is anticipated during the life of the plan due to the low mineral potential and lack of access.

Potential impacts to soil and water resources from locatable minerals management would be greater under Alternative C than Alternatives A and B because new areas would be opened to mineral entry and development. Placer mine operations have the potential to adversely impact soil resources and water quality through erosion, unintended discharge of settling ponds, and subsequent increased downstream turbidity. Depending on the methods used and size of operation, mining operations could impact the natural water quality and flow characteristics of selected river segments. Disturbance to soil and water resources from a particular mining operation would be mitigated through ROPs and the NEPA process.

Effects from Recreation

Same as Alternative B.

Effects from Travel Management

Same as Alternative B.

4.6.1.4.4. Alternative D

Effects from Locatable Minerals

Under Alternative D, the entire Upper Black River Subunit (2,361,000 acres) would be open to locatable mineral entry. The potential for adverse impacts to soil and water resources would

be greater than under Alternatives A, B, but the same as Alternative C. However, little if any, locatable mineral activity is anticipated due to the lack of access and the low mineral potential. Disturbance to soil and water resources from a particular mining operation would be mitigated through ROPs and the NEPA process.

Effects from Recreation

Same as Alternative B.

Effects from Travel Management

Same as Alternative B.

4.6.1.5. Visual Resources Upper Black River Subunit

Summary of Effects

VRM Classes outline the level of change that could occur within that class. Identifying an area as a specific management class does not guarantee that change will take place. The discussion below identifies the number of acres that may retain or lose visual quality due to management in a specific VRM Class; however, the potential for every acre to lose visual quality due to management in a specific VRM Class is extremely low. The analysis logically assumes that areas designated as VRM Class III and IV would permit more surface-disturbing impacts and potentially have greater adverse impacts on visual resources and scenic quality than those areas designated as VRM Class I and II.

In addition to those impacts discussed as common to all subunits under section 4.3.1.9, the following impacts may occur in the Upper Black River Subunit. For the visual resource inventory see Appendix D, *Visual Resource Inventory*.

Alternatives — VRM Management Class Designations		VISUAL RESOURCES INVENTORY CLASS DESIGNATION							
		VRI Class I		VRI Class II		VRI Class III		VRI Class IV	
		0	0%	1,477,000	63%	447,000	19%	435,000	18%
Alternative A	Acres	There is no current land use plan, thus VRM Classes have not been assigned to any lands under Alternative A.							
Alternative B	Acres	Acres	%	Acres	%	Acres	%	Acres	%
VRM I									
VRM II	2,359,000			1,478,000	63	448,000	19	435,000	18
VRM III									
VRM IV									
Total	2,361,000			1,478,000	63	448,000	19	435,000	18
Alternative C	Acres	Acres	%	Acres	%	Acres	%	Acres	%
VRM I									
VRM II	623,000			55,000	23	52,000	2	23,000	1
VRM III									
VRM IV	1,738,000			929,000	39	397,000	17	413,000	18
Total	2,361,000			1,478,000	63	448,000	19	435,000	18
Alternative D	Acres	Acres	%	Acres	%	Acres	%	Acres	%
VRM I									
VRM II									
VRM III									
VRM IV	2,361,000			1,478,000	63	448,000	19	435,000	18
Total	2,361,000			1,478,000	63	448,000	19	435,000	18

4.6.1.5.1. Effects Common to All Alternatives

Effects from Cave and Karst Resources

Management of significant caves according to federal laws and regulations, and to prevent resource damage would will help maintain visual resources at the current level of development under all alternatives.

Effects from Salable Minerals

The impacts from the extraction of salable minerals would vary depending on the methods used, the size of operation and the number of mines. Although the acreage open to salable minerals would vary from 1,740,000 acres to 2,161,000 acres depending on the alternative, mineral material sales are not anticipated in the Black River Subunit during the life of the plan due to its remoteness and lack of roads. Thus no impacts are anticipated under any alternative.

4.6.1.5.2. Alternative A (No Action)

Under Alternative A, visual resources would be managed on a project-specific basis as no visual resource management classes have been established. Visual resources would be protected through the use of management class inventory objectives and the visual contrast rating process.

Effects from Visual Resources

This subunit has never been covered by a land use planning process. No VRM Classes have ever been assigned, thus the entire subunit would remain unclassified.

Effects from Forest and Woodland Products

Under Alternative A, permits for all types of forest product or timber harvest would be considered throughout the subunit (2,361,000 acres). The size and scope of impacts would depend on the size of the area and harvest techniques used. Given the remote nature, lack of access, and lack of commercially valuable timber, few if any, requests for commercial use of forest products or timber are anticipated. No permits have been issued for this area in the past. The types of impacts that could occur if harvest were permitted, are discussed in section 4.3.1.9 Impacts Common to All Subunits.

Effects from Lands and Realty

Under Alternative A, permits for land use authorizations would be considered throughout the subunit. The size and scope of impacts would depend on the type of authorization. Given the remote nature and lack of access to the subunit, few if any, requests for land use authorizations are anticipated during the life of the plan. The types of impacts that could occur if such uses are permitted, are discussed in section 4.3.1.9 Impacts Common to All Subunits.

Effects from Leasable and Locatable Minerals

The entire subunit (2,361,000 acres) is closed to locatable mineral entry and mineral leasing, subject to valid existing rights. There are no existing mining claims. Under Alternative A, the subunit would remain closed, protecting visual resources by limiting surface disturbance activities associated with mining.

Effects from Travel Management

There are no OHV designations in place and OHV use is unrestricted on 2,361,000 acres. Impacts to visual resources from various types of travel are described in section 4.3.1.9 Impacts Common to All Subunits. The level of impact would be dependent on the types and levels of use. Given the lack of roads and trails in the subunit, current OHV use is likely very limited, consisting of primarily aircraft, boats, and snowmobiles.

4.6.1.5.3. Alternative B

In general, Alternative B anticipates the lowest level of resource development and adopts VRM classes that would be the most restrictive to development. Additional impacts beyond those discussed as common to all subunits under section 4.3.1.9 are discussed below.

Effects from Fish and Aquatic Species

There are 28 Riparian Conservation Areas (RCAs) identified for accelerated rehabilitation of habitats which include active revegetation and streambank stabilization techniques on 624,000 acres. These activities would have a positive impact to areas with surface disturbance in returning the disturbance to a more natural looking landscape faster than natural revegetation.

No lands were identified as VRI Class I lands. Of VRI Class II lands, one-hundred percent or 351,000 acres would be managed as Class II. Of VRI Class III lands (212,000 acres) one-hundred percent would be managed as Class II lands resulting in preservation of the existing visual character of these lands. Of VRI Class IV lands one-hundred percent (61,000 acres) would be managed as Class II lands resulting in preservation of the existing visual character of these lands.

Effects from Visual Resources

No lands were inventoried as VRI Class I acres under any alternative. Under Alternative B, of VRI Class II lands (sixty-three percent), one-hundred percent (1,478,000 acres) would be managed as VRM Class II allowing a low level of change. These lands have either a B or C rating for scenic quality, a medium sensitivity and occur in all three distance zones.

Of VRI Class III lands (nineteen percent), one-hundred percent (448,000 acres) would be managed as VRM Class II allowing a low level of change to the landscape. These lands have a B or C rating for scenic quality, a medium sensitivity and occur in all three distance zones.

Of VRI Class IV lands (eighteen percent), one-hundred percent (435,000 acres) will be managed as VRM Class II lands allowing a low level of change to the landscape. These lands have a B or C rating for scenic quality, have medium sensitivity and occur in all three distance zones.

Using design fundamentals of proper siting and location, reducing unnecessary disturbance and by repeating the landscape elements of form, line, color and texture for all surface-disturbing activities regardless of VRM Class can contribute significantly in reducing impacts to visual resources.

Effects from Wilderness Characteristics

Visual characteristics are related to the criteria used to determine the presence of wilderness characteristics which includes naturalness. Management decisions to preserve wilderness characteristics help to preserve the visual resources of the area by limiting surface-disturbing

activities and maintaining natural vegetation and landform. Under Alternative B, wilderness characteristics would be maintained on one-hundred percent of the lands with wilderness characteristics (2,357,000 acres) limiting activities that impact the appearance of naturalness.

No lands with wilderness characteristics were identified as VRI Class I lands. Of VRI Class II lands with wilderness characteristics, one-hundred percent or 1,478,000 acres would be managed as Class II. Of VRI Class III lands with wilderness characteristics (448,000 acres) one-hundred percent would be managed as Class II resulting in preservation of the existing visual character of these lands. Of VRI Class IV lands with wilderness characteristics one-hundred percent (431,000 acres) would be managed as Class II lands resulting in preservation of the existing visual character of these lands.

Effects from Forest and Woodland Products

Under Alternative B, personal use of timber and commercial use of forest products would be considered throughout the subunit (2,361,000 acres). The size and scope of impacts would depend on the size of the area and harvest techniques used.

No commercial or salvage timber sales would be allowed. Temporary camps and various impacts from different harvest techniques would not impact 2,361,000 acres. These closures would help protect visual resources. However, given the lack of access and low timber values in the subunit, few if any, commercial sales are anticipated.

Effects from Lands and Realty

Under Alternative B, the entire subunit, is identified for retention by the BLM; private inholdings would be considered for acquisition to consolidate land ownership patterns. These decisions would help protect visual resources on these lands.

Within the Salmon Fork ACEC, rights-of-way (ROW) would generally not occur if other suitable locations are available. This would protect visual resources by not allowing clearance of vegetation and construction of structures associated with different kinds of ROW. A natural landscape in line, form, color and texture would be maintained on 621,000 acres. Given the remote location of the subunit, few if any, ROW are anticipated. Other types of land use authorizations would be considered throughout the subunit and impacts would be the same as Alternative A.

Effects from Leasable and Locatable Minerals

Same as Alternative A, the subunit would be closed to these types of uses, protecting visual resources by limiting surface-disturbing activities. No lands were identified as VRI Class I lands. Of VRI Class II lands, one-hundred percent or 1,478,000 acres would be managed as Class II. Of VRI Class III, one-hundred percent or 448,000 acres would be managed as Class III lands. Of Class IV lands one-hundred percent (435,000 acres) would be managed as Class IV lands.

Effects from Travel Management

The restriction of motorized use to OHVs weighing 1,000 pounds curb weight and less without permit for winter travel, and 1,500 pounds curb weight for summer travel within the entire subunit helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape even with cross-country travel allowed. The lighter weight vehicles tend to be smaller and narrower, thus impacting vegetation on a smaller

footprint or scale. Weight restricted travel impacts 2,361,000 acres. Impacts to visual resources by open cross-country travel are described under section 4.3.1.9 Impacts Common to All Subunits.

The closure of the Salmon Fork ACEC to summer OHV use will prevent surface disturbance to vegetation and soils from the use of motorized vehicles, thus protecting the visual resources of the natural landscape on 621,000 acres. The use of larger motorized vehicles within the Upper Black River Subunit could be authorized by permit. The impacts larger vehicles would vary depending on the size of vehicle, season of travel, and the number of passes made. Impacts would be similar to those described for cross-country travel under section 4.3.1.9 Impacts Common to All Subunits except on a larger scale. Although much of the subunit would be open to cross-country motorized use, the lack of trails and remote nature of the subunit would limit the level of use.

Effects from Special Designations

Under Alternative B, 621,000 acres would be designated as the Salmon Fork ACEC to manage limestone habitats and steep south facing slopes and bluffs for rare flora, and to protect Bald Eagle nesting habitat, salmon habitat, and caribou habitat. Management decisions to protect fish and wildlife habitat in the ACEC would help preserve the visual character of the area.

No lands were identified as VRI Class I lands. Of VRI Class II lands, one-hundred percent or 549,000 acres would be managed as Class II. Of VRI Class III lands (51,000 acres) one-hundred percent would be managed as Class II lands resulting in the preservation of the existing visual character of these lands. Of VRI Class IV lands one-hundred percent (20,000 acres) would be managed as Class II lands resulting in the preservation of the existing character of these lands.

Approximately 15,500 acres associated with the Salmon Fork of the Black River would be maintained as a natural landscape under the eligibility as a “wild” river. “Wild” rivers are essentially primitive and undeveloped. Management decisions to preserve these characteristics help to preserve the visual resources of the area by limiting surface-disturbing activities and maintaining natural vegetation and landform.

4.6.1.5.4. Alternative C

Additional impacts beyond those discussed as common to all subunits in section 4.3.1.9 are discussed below.

Effects from Fish and Aquatic Species

There are 13 RCAs identified for accelerated rehabilitation of habitats which include active revegetation and streambank stabilization techniques on 205,000 acres. These activities would have a positive impact to areas with surface disturbance in returning the disturbance to a more natural looking landscape faster than natural revegetation.

No lands were identified as VRI Class I lands. Of VRI Class II lands, forty-nine percent or 100,000 acres would be managed as Class II while fifty-one percent or 105,000 acres would be managed as Class IV lands allowing visual changes to the natural landscape to occur. Of VRI Class III lands, ninety-six percent or 37,000 acres would be managed as Class II lands resulting in preservation of the existing visual character of these lands while four percent or 2,000 acres would be managed as Class IV lands allowing visual changes to the natural landscape to occur. Of VRI Class IV lands ninety-five percent (1,000 acres) would be managed as Class II lands

resulting in preservation of the existing visual character of these lands while five percent (48 acres) would be managed as Class IV lands.

Effects from Visual Resources

No lands were identified as VRI Class I lands. Of VRI Class II lands (sixty-three percent), approximately thirty-seven percent (549,000) would be managed as VRM Class II allowing a low level of change. Approximately sixty-three percent (929,000 acres) would be managed as VRM Class IV potentially resulting in a high level of change to landscape characteristics. These lands have an A rating for scenic quality, a medium sensitivity, and occur in all three distance zones.

Of VRI Class III lands (nineteen percent), eleven percent (51,000 acres) would be managed as VRM Class II allowing a low level of change, while eighty-nine percent (397,000) would be managed as VRM Class IV potentially resulting in a high level of change to landscape characteristics. These lands have a B rating for scenic quality, a medium sensitivity, and occur in the Foreground-Middleground distance zone.

Of VRI Class IV lands (eighteen percent), approximately five percent (23,000 acres) would be managed as VRM Class III potentially resulting in only partial retention of landscape characteristics, while ninety-five percent (413,000 acres) would be managed as VRM Class IV potentially resulting in a high level of change to landscape characteristics. These lands have either a B or C rating for scenic quality, a medium sensitivity, and occur in all three distance zones.

Using design fundamentals of proper siting and location, reducing unnecessary disturbance and by repeating the landscape elements of form, line, color and texture for all surface-disturbing activities regardless of VRM Class can contribute significantly in reducing impacts to visual resources.

Effects from Wilderness Characteristics

Visual characteristics are related to the criteria used to determine the presence of wilderness characteristics which includes naturalness. Management decisions to preserve wilderness characteristics help to preserve the visual resources of the area by limiting surface-disturbing activities and maintaining natural vegetation and landform. Under Alternative C, wilderness characteristics would be maintained on twenty-six percent of the lands with wilderness characteristics (621,000 acres) limiting activities that impact the appearance of naturalness.

No lands were identified as VRI Class I lands. Of VRI Class II lands with wilderness characteristics, one-hundred percent or 549,000 acres would be managed as Class II. Of VRI Class III lands with wilderness characteristics (51,000 acres) one-hundred percent would be managed as Class II resulting in preservation of the existing visual character of these lands. Of VRI Class IV lands with wilderness characteristics one-hundred percent (20,000 acres) would be managed as Class II lands resulting in preservation of the existing visual character of these lands.

Effects from Forest and Woodland Products

Impacts from personal use of timber and commercial use of forest products would be the same as Alternative B. Additionally, timber salvage sales would be allowed throughout the subunit and commercial timber sales would be allowed except in the Salmon Fork ACEC (621,000 acres). This closures would help protect visual resources. Temporary camps and various impacts from different harvest techniques could impact areas open to harvest. However, few if any, commercial sales are anticipated.

Effects from Land and Realty

Effects from land tenure decisions would be the same as Alternative B. Regarding land use authorizations, the entire subunit (2,361,000 acres) would be available for ROW permits with possible clearance of vegetation and structures associated with different kinds of ROW activities, and result in contrast with the natural landscape in line, form, color and texture as described in section 4.3.1.9.

Effects from Leasable Minerals

Under Alternative C, the seventy-four percent of the subunit would be open to mineral leasing. Minor constraints, such as seasonal restrictions, would apply to 737,000 acres, including lands around Circle, and the Salmon Fork ACEC would be closed (621,000 acres). Minor constraints would protect visual resources by limiting surface-disturbing activities at least seasonally. Impacts to visual resources by exploration, development and production of solid leasable minerals on the remaining 1,625,000 acres would depend on the scale of the activity. Impacts would be unlikely, as no development or exploration of solid leasable minerals is anticipated due to the low potential for these minerals and lack of access.

Seismic exploration could occur on high oil and gas potential lands near Circle. Changes to line, form, color, and texture may occur due to clearing of seismic lines. However, no development of fluid leasable minerals is anticipated during the life of the plan.

Effects from Locatable Minerals

Under Alternative C, the entire subunit would be open to locatable mineral entry and associated surface-disturbing activities. The impacts from the extraction of locatable minerals would vary depending on the methods used, the size of operation and the number of mines. It is anticipated that mining will not take place during the life of this plan due to lack of access and low mineral values. Thus impacts are not anticipated.

Effects from Travel Management

Effects from travel management would be the same as Alternative B except in the Salmon Fork ACEC. Under this alternative, the Salmon Fork ACEC would be open to summer motorized use of OHV weighing 1,500 pounds curb weight or less. This would result in the potential impacts to visual resources on 2,361,000 acres similar to those described in section 4.3.1.9 Impacts Common to All Subunits.

Effects from Special Designations

Same as Alternative B, the Salmon Fork ACEC would be designated. However, under Alternative C, the ACEC would be open to salable and leasable minerals. Cross-country use of vehicles weighing 1,500 pounds curb weight and less during summer and 1,000 pounds curb weight during winter would be allowed year round and it would not be a ROW avoidance area.

4.6.1.5.5. Alternative D

In general, Alternative D anticipates the greatest amount of resource development and adopts the least restrictive VRM classes, allowing for major development while protecting visual resource in certain areas. Impacts beyond those discussed as common to all subunits in section 4.3.1.9 are discussed below.

Effects from Fish and Aquatic Species

There are five RCAs identified for accelerated rehabilitation of habitats which include active revegetation and streambank stabilization techniques on 205,000 acres. These activities would have a positive impact to areas with surface disturbance in returning the disturbance to a more natural looking landscape faster than natural revegetation.

No lands were identified as VRI Class I lands. Of VRI Class II lands, one-hundred percent or 123,000 acres would be managed as Class IV allowing a visible level of change to the landscape. Of VRI Class III lands (34,000 acres) one-hundred percent would be managed as Class IV lands allowing a visible level of change to the landscape. Of VRI Class IV lands one-hundred percent (1,000 acres) would be managed as Class IV lands.

Effects from Visual Resources

Of VRI Class II lands (sixty-three percent), one-hundred percent (1,478,000 acres) would be managed as VRM Class IV. Of VRI Class III (nineteen percent, 448,000 acres) and Class IV lands (eighteen percent and 435,000 acres), one-hundred percent would also be managed as VRM Class IV, potentially resulting in a high level of change to landscape characteristics throughout the subunit. These lands have either a B or C rating for scenic quality, a medium sensitivity, and occur in all three distance zones.

Using design fundamentals of proper siting and location, reducing unnecessary disturbance and by repeating the landscape elements of form, line, color and texture for all surface-disturbing activities regardless of VRM Class can contribute significantly in reducing impacts to visual resources.

Effects from Wilderness Characteristics

Under Alternative D, wilderness characteristics would not be actively maintained on any lands. Visual resources would not be protected by management for wilderness characteristics.

Effects from Forest and Woodland Products

Impacts would be the same as under Alternative C, except commercial sales would be allowed in the Salmon Fork ACEC. Impacts to visual resources from commercial sales could potentially occur anywhere in the subunit (2,361,000 acres). The size and scope of impacts would depend on the size of the area and harvest techniques used. Impacts are discussed in section 4.3.1.9 Impacts Common to All Subunits. Given the lack of access and low timber values in the subunit, few if any, commercial sales are anticipated.

Effects from Land and Realty

Effects from land tenure and land use authorizations would be the same as Alternative C.

Effects from Leasable Minerals

Effects would essentially be the same as Alternative C, although minor constraints would apply to 16,000 fewer acres under Alternative D.

Effects from Locatable Minerals

Same as Alternative C.

Effects from Travel Management

Same as Alternative C.

Effects from Special Designations

Same as Alternative B, the Salmon Fork ACEC would be designated. Management of the ACEC would be similar to Alternative C.

No lands were identified as VRI Class I lands. Of VRI Class II lands, one-hundred percent or 549,000 acres would be managed as Class IV allowing visual changes to the natural landscape to occur. Of VRI Class III lands (51,000 acres) one-hundred percent would be managed as Class IV lands allowing visual changes to the natural landscape to occur. Of VRI Class IV lands one-hundred percent (20,000 acres) would be managed as Class IV lands.

Same as Alternative C, no rivers would be recommended suitable for inclusion to the NWSR.

4.6.1.6. Wilderness Characteristics Upper Black River Subunit

Summary of Effects

There are 2,357,000 acres identified within the Upper Black River Subunit as having wilderness characteristics of size, naturalness, and the opportunity for solitude or a primitive unconfined type of recreation experience. Managing lands for wilderness characteristics would limit many surface-disturbing activities. See section 4.3.1.10 Impacts Common to All Subunits for impacts to wilderness characteristics. Alternative B would protect the most acres for wilderness characteristics while Alternative A would not identify any acres as having wilderness characteristics. Alternative C provides a balance between protection and resource use while Alternative D provides for resource development and protects the least amount of land for wilderness characteristics.

4.6.1.6.1. Alternative A (No Action)

No lands are managed for wilderness characteristics under this Alternative. Of the 2,357,000 acres identified as having wilderness characteristic, none would be directly managed to protect those values. Other actions and management strategies, and the remote nature of the area may help protect those values indirectly. The entire subunit is currently closed to locatable and leasable minerals.

4.6.1.6.2. Alternative B

Of the 2,357,000 acres identified as having wilderness characteristic, one-hundred percent, would be directly managed to protect those values. The entire subunit would be closed to locatable and leasable mineral entry. Additionally, these lands are very remote and difficult to access. Activities that would negatively affect wilderness characteristics are not expected to occur over large acreages.

4.6.1.6.3. Alternative C

Of the 2,357,000 acres identified as having wilderness characteristic, 621,000 acres (twenty-six percent), would be directly managed to protect those values. These areas include the Salmon Fork ACEC and thirteen RCAs. Other actions and management strategies may help protect wilderness values indirectly on the remaining 1,740,000 acres. Leasable mineral exploration or development would be possible on 1,740,000 acres; while the entire 2,357,000 acres would be open to locatable minerals, the reasonably foreseeable development scenario does not suggest any development during the life of the plan. It would take several years to modify existing withdrawals. Mineral potential is very low and mining would be unlikely. Oil and gas leasing is not anticipated although a very limited amount of seismic exploration could occur in the southern part of the subunit. Even if all development is realized it would affect much less than one percent of all available acres. If mining-related exploration occurred, naturalness would be impacted within the view shed of the development until the site was reclaimed to the extent that it appeared natural looking see section 4.3.1.10 Impacts Common to All Subunits. Additionally, these lands are very remote and difficult to access. Activities that would negatively affect wilderness characteristics are not expected to occur over large acreages.

4.6.1.6.4. Alternative D

Of the 2,357,000 acres identified as having wilderness characteristic, 0 acres, would be directly managed to protect those values. As in Alternative C, other actions and management strategies may help protect wilderness values in the subunit. Mineral exploration or development would be possible in the entire subunit however the reasonably foreseeable development scenario does not suggest any development during the life of the plan. It would take several years to modify existing withdrawals. Mineral potential is very low and mining would be unlikely. Even if all development is realized it would affect less than one percent of all available acres. If mining-related exploration occurred, naturalness would be impacted within the view shed of the development until the site was reclaimed to the extent that it appeared natural looking see section 4.3.1.10 Impacts Common to All Subunits. Additionally, these lands are very remote and difficult to access. Activities that would negatively affect wilderness characteristics are not expected to occur over large acreages.

4.6.1.7. Wildlife Upper Black River Subunit

Summary of Effects

The Upper Black River subunit is generally very remote and infrequently visited. Little is known of wildlife resources in the area and so impacts are difficult to predict. Due to its remoteness (high transportation cost) and generally mineral potential considered low, little resource development or motorized vehicle use is predicted, even in alternatives which open nearly the entire area to such uses. As a result, few broad-scale impacts are anticipated in any alternative during the life of the plan. However, mineral resources may be more abundant than predicted and/or the development of resources on private lands may make development on BLM lands more economic. Mining claims carry development rights which could have unpredictable long-term effects on wildlife resources. Designation of the ACEC and closing it to locatable minerals (in Alternative B) will protect wildlife resources in the area where subsistence use is most prevalent.

4.6.1.7.1. Effects Common to All Alternatives

4.6.1.7.2. Alternative A (No Action)

Effects from Leasable and Locatable Minerals

There will be little to no effects from mining. The entire unit is withdrawn from mineral leasing, location, and entry. There are no existing leases or existing mining claims. Exploration activities are unlikely.

Effects from Recreation and Travel Management

The area is being managed in custodial manner, no recreation management areas are identified. Use of motorized vehicles is unrestricted; however, the area is generally very remote and little motorized use occurs. The subunit is most accessible in winter by snowmobiles; the most accessible portion are lands occurring east of Circle. Impacts from a small number of federally qualified subsistence users, winter trappers, and occasional summer recreationists are very small. Motorized boats are permitted (as in all alternatives) and summer cross-country OHV use is allowed throughout the subunit. Large OHVs are permitted, which could cause localized impacts to habitat. Due to the low level of existing and expected motorized use, impacts are anticipated to be low. OHV use may occur in the area east of the Yukon River from Circle through use of old seismic exploration trails. OHVs transported up to the Salmon Fork via riverboat could possibly be used in that area, but such use is likely to be uncommon. Area- or season-specific closures could be implemented to protect resources at risk of impact.

4.6.1.7.3. Alternative B

Effects from Leasable and Locatable Minerals

Same as A. The entire subunit remains closed to mineral entry and leasing.

Effects from Recreation and Travel Management

Similar to Alternative A, but OHVs would be limited to 1,000 pounds curb weight and summer OHV use would not be allowed within the Salmon Fork ACEC. Little recreational and vehicular use is expected and so impacts are expected to be very low. New restrictions can be developed if resource impacts develop or become expected.

Effects of Special Designations

Under Alternative B, the Salmon Fork Black River drainage is designated as the Salmon Fork ACEC (Map 69) and is closed to locatable mineral entry, leasable minerals, and salable minerals. It will be retained in federal management and be a right-of-way avoidance area. This will serve to maintain the Salmon Fork area in its current primitive condition with primary land uses being subsistence hunting and trapping. The entire subunit is closed to commercial timber sales. Although winter snowmobiles would be allowed, remoteness would limit the number and intensity of use. The ACEC designation would maintain habitat for Porcupine caribou, bald eagle, and other wildlife, including those used for subsistence. The allowance of motorized boats on the Salmon Fork is a continuation of the current situation. Although motorized activity may affect nesting eagles or other raptors, the level of use is very low and impacts should be minor.

The Salmon Fork is recommended as suitable as a WSR. Until a non-designation decision was made by Congress, management would preserve ORVs. The identified ORV is wildlife, including a far northern nesting population of bald eagles (at the Arctic Circle). Management as a WSR would benefit this and other wildlife resource values.

4.6.1.7.4. Alternative C

Effects from Locatable and Leasable Minerals

The entire subunit is open to locatable minerals. Only the Salmon Fork ACEC (621,000 acres) would be closed to leasable minerals. The leasable mineral potential is generally considered to be low (except on lands near Circle), and the area is mostly very remote. Seismic oil and gas exploration is predicted to be unlikely, but could potentially occur on lands with high oil and gas potential (those near Circle). The locatable mineral potential is also considered to be low and no mining operations are predicted for the life of the plan. However, the area has also had little exploration activity and potential may be underestimated. Some exploration will likely occur.

Riparian conservation areas (section 2.7.2.1.1.3 Fish and Aquatic Species) are designated in only two drainages (the tributaries and mainstem of the Kandik river and Salmon Fork, Map 12). In these areas, RCAs will reduce potential impacts of locatable mineral development (particularly placer mining) on riparian and aquatic habitats by improving reclamation.

Little is known of wildlife resources in this subunit, limiting our ability to predict impacts. Dall sheep are thought to occur only sporadically in a few areas along the Canada border. Other than seasonal restrictions on aircraft activity in ROPs (Appendix A, *Required Operating Procedures and Fluid Mineral Leasing Stipulations*), there are no specific protections for Dall sheep. Caribou of the Porcupine Herd occur in the area during winter and exploration or production could potentially create local displacement and some fragmentation of habitat. Given the limited exploration and development of locatable and leasable minerals expected, impacts to wildlife are expected to be correspondingly limited, and mostly local in extent. If mining roads or trails remain un-connected to the Alaska highway system, impacts would be lower than those in more accessible areas.

Effects from Recreation and Travel Management

Effects would be similar to Alternative B with the exception that because summer use OHV is allowed in the Salmon Fork ACEC, potential for effects relative to Alternative B may increase slightly.

Effects from Special Designations

The Salmon Fork ACEC would be closed to salable and leasable minerals, but open to locatable minerals. Stream reclamation standards of RCAs would also apply to the entire ACEC, reducing impact potential slightly to moderately.

No rivers would be recommended as suitable for designation. Impacts to nesting bald eagles under this alternative are expected to be low, but disturbance or changes in water quality could occur if substantial mining activity occurs on the Salmon Fork or tributaries.

4.6.1.7.5. Alternative D

Effects from Locatable and Leasable Minerals

As in Alternative C, the entire subunit is open to locatable and leasable minerals, including the Salmon Fork ACEC. A few tributaries of the Salmon Fork and Kandik rivers which were designated as RCAs in Alternative C are not designated in this alternative (Map 13). Impacts will be similar to those identified in Alternative C, except that fewer RCAs are designated. Impacts will depend on actual levels of exploration, development, and claim staking.

Effects from Recreation and Travel Management

Same as Alternative C.

Effects from Special Designations

The Salmon Fork ACEC (621,000 acres) would be open to locatable mineral entry and it would be open to mineral leasing with minor constraints. In this alternative ACEC management intent remains the same, but management decisions differ little from the rest of the subunit, except that leasing will be subject to minor constraints.

No rivers would be recommended as suitable for designation, same as Alternative C. However, there may be some potential for impacts to nesting bald eagles and other wildlife under this alternative, as mining claims may be established and mineral leasing may occur.

4.6.1.7.6. Cumulative Impacts

Although lands in this subunit are considered generally of low potential for mineral development, several large blocks of land have been conveyed to Native corporations, indicating substantial mineral potential. Mineral development on those lands could effect wildlife resources on adjacent BLM lands, especially if road access were developed. Staking of mining claims may have effects beginning well beyond the life of the plan. See also section 4.3.1.12.6 Cumulative Effects, Wildlife.

4.6.2. Resource Uses

4.6.2.1. Locatable Minerals Upper Black River Subunit

Summary of Effects

The Upper Black River Subunit has low known locatable mineral potential and activity would be limited, despite the large acreage available under some alternatives. Alternatives A and B would not open up any lands to mineral entry. Alternatives C and D would open from 1.74 million acres to 2.36 million acres.

4.6.2.1.1. Effects Common to All Alternatives

State- and Native-selected lands will remain segregated from mineral entry and location until final land title has been established. New mining operations on withdrawn lands will require a validity exam prior to approval of a Plan of Operation. All active mining operations will be

required to submit a plan of operation if the 1,000 ton bulk sample is exceeded (3809.11(b)). Mining operations using cyanide in the processing of amenable ores will require a Plan of Operations. Mining claim surface occupancy is guaranteed but must remain reasonably incident to the current levels of mining activity. Bonding is required of all mining operations other than those grandfathered. Reclamation of surface disturbance is required. Undue and unnecessary degradation will remain the standard for mining operations on BLM lands. The right of reasonable access across BLM lands to unpatented federal mining claims is assured. Cultural resources encountered during surface-disturbing activities are subject to the Antiquities Act.

4.6.2.1.2. Alternative A (No Action)

Under Alternative A, the ANCSA 17(d)(1) withdrawals would not be revoked and there are no existing federal claims. This alternative would offer no process to address these closures.

4.6.2.1.3. Alternative B

Under Alternative B, the entire subunit would remain closed to locatable mineral entry.

4.6.2.1.4. Alternative C

Under Alternative C, 2,361,000 acres would be available to locatable mineral entry. The drainages in this subunit do not have much potential for mining, but this is primarily due to lack of data.

4.6.2.1.5. Alternative D

Under Alternative D, 2,361,000 acres would be available to locatable mineral entry. The drainages in this subunit do not have much potential for mining, but this is primarily due to lack of data.

4.6.2.1.6. Cumulative Impacts

Impacts to locatable minerals that are individually minor may cumulatively reduce exploration and production of commodities from public lands. Factors that affect mineral extraction and prospecting include, but are not limited to, such things as permitting and permitting delays, regulatory policy, public perception and concerns, travel management, transportation, mitigation measures, proximity to sensitive areas (such as ACECs), low commodity prices, taxes, and housing and other necessities for workers. The BLM has no control over many of these factors. Most of these factors result in additional costs and/or permitting delays that can individually or cumulatively add additional costs to projects.

Lack of access to public land could reduce the amount of mineral exploration and development that may occur. Mineral resources in other ownerships may not be developed if the adjacent public lands are withdrawn from mineral entry, because the deposit may not be economically feasible to develop if it crosses ownerships and only a portion is available for development.

Alternative B is the most restrictive to mineral development and would result in the greatest cumulative impacts. The entire subunit is closed with emphasis placed on other resources.

4.6.2.2. Recreation Upper Black River Subunit

Summary of Effects

Effects on recreation management from the proposed alternatives would result in a wide range of possible outcomes. Proper resource management, including site-specific measures to protect healthy, functioning watersheds, riparian areas, and associated fish and wildlife habitats, would result in short- and long-term, beneficial impacts to fish and game related recreation use.

Special designations and management applied to these areas, including ACECs and WSRs, would further protect the region, potentially increasing wildlife numbers that benefit wildlife viewing, hunting, and fishing opportunities. Proposed management in ACECs and WSRs would encourage recreation activities of a more non-motorized, Semi-Primitive nature. As the size and scope of these special designations increase, opportunities for non-motorized forms of recreation would also increase. Negative effects from these designations would also arise, if additional restrictions were placed on OHV use and other recreational activities.

All lands (2,361,00 acres) in the Upper Black River Subunit under all action alternates, would be managed for custodial actions only, addressing visitor health and safety, user conflict, and resource protection issues. Land, water, and snow based activities would continue to remain the focus in this area, providing access for the commonly conducted activities of hunting, fishing, trapping, and gathering of edible plants and berries.

Alternative C best meets the goal of providing for multiple recreation use, while sustaining the recreation-resource base and other sensitive resource values of the region. Alternative B emphasizes less motorized recreation use in a more primitive setting, while Alternatives A, C, and D offer slightly more motorized recreation opportunities.

4.6.2.2.1. Effects Common to All Alternatives

Effects from Forest and Woodland Products

Under all alternatives, the effects of forest and woodland products harvest would result in minimal impacts to recreation management. Current levels of firewood collection, commercial harvests, and forest products gathering would continue to be sustained without significant resource damage. However, if significant sales occurred, due to bark beetle infestations or from commercial timber harvests, recreational users would see increased trails, potential dislocation of wildlife, and alteration of scenic viewsheds. Although the areas open to commercial uses vary between alternatives, the low demand and lack of timber resource would limit these uses in all alternatives.

Effects from Recreation

Under all alternatives, recreation management would continue to provide for custodial actions only, through minimal facilities, structures, and regulations, except when deemed necessary to address visitor health and safety, user conflicts, and resource protection issues. Together, these actions would directly affect recreation management by ensuring that land- and water-based recreation opportunities continue to exist in the Upper Black River Subunit. No recreation opportunity spectrum settings would apply.

Special Recreation Permits would continue to be issued as appropriate, allowing managers to provide for safe and enjoyable recreation opportunities at fair and allowable levels. This would

minimize user conflicts while ensuring that recreation activity levels do not negatively impact the recreation-resource base and other sensitive resource values of the region.

Effects from Travel Management

Under all alternatives, all forms of non-motorized use would be allowed, providing users with opportunities for float-boating and hiking. Motorboat and aircraft use would also be unrestricted. Winter use (October 15 through April 30) of snowmobiles of 1,000 pounds curb weight and less would be allowed, providing users with winter access for subsistence, traditional, and recreational activities.

4.6.2.2.2. Alternative A (No Action)

Effects from Visual Resources

No visual management classes have been established under Alternative A. Impacts to visual resources would be evaluated and mitigated as proposals for development or permits are received.

Effects from Locatable Minerals

There would be no effects from locatable minerals as the entire subunit is withdrawn from mineral entry and there are no existing mining claims.

Effects from Travel Management

Alternative A provides the most motorized public access of any of the alternatives, as OHV use would remain generally unrestricted due to the lack of travel management decisions. Allowing this level of continued OHV use would not address future resource and user conflict issues and could result in emergency closures to protect the recreation-resource base and other sensitive resource values of the region. These actions could also result in long-term, detrimental impacts to scenic viewsheds that enhance the quality of recreational experiences for other recreation users. Thus, while this alternative would offer the most opportunities for recreational activities that involve the use of motorized travel, including hunting and OHV riding; fewer opportunities would exist for recreational users seeking a primitive, non-motorized type of experience. These effects would likely be minimal due to the lack of access and low levels of motorized use likely to occur in the subunit.

4.6.2.2.3. Alternative B

Effects from Visual Resources

Under Alternative B, the entire Upper Black River Subunit would be managed as a VRM Class II. This decision would have long-term, beneficial impacts on recreational activities that include scenic qualities as part of the experience. Minor effects may result if restrictions are placed on OHV use, in areas that possess a moderate level of recreation demand. Currently, there are no areas of moderate demand in the subunit due to its remote location and lack of access.

Effects from Wilderness Characteristics

Under Alternative B, almost the entire subunit (2,357,000 acres) would be managed for the maintenance of wilderness characteristics. This would provide additional opportunity for those

individuals seeking a primitive and unconfined recreation experience and would ensure that the opportunity remains available for future recreation users.

Effects from Locatable Minerals

Under Alternative B, the entire subunit would be closed to locatable mineral entry and there would be no effects.

Effects from Travel Management

Under all action alternatives, travel management decisions would provide for a range of motorized and non-motorized recreation experiences, while protecting resource values and minimizing user conflicts. This comprehensive approach to travel management would allow the BLM to sustain recreation opportunities and experiences, visitor access and safety, and natural resources of the subunit.

Under Alternative B, travel within the Black River Subunit would be limited to the summer-use of OHVs weighing 1,500 pounds curb weight and less outside of the Salmon Fork ACEC, no summer OHV use within the ACEC, and the winter use of snowmobiles of 1,000 pounds curb weight and less throughout the entire subunit. All other forms of OHV use would require a permit or approved plan of operation. These management actions, while promoting the effects of special designations through restricting summer-access to the Salmon Fork ACEC, would negatively impact those users who utilize OHVs for accessing remote areas, and by those retrieving game. These effects would likely be minimal due to the lack of access and low levels of motorized use likely to occur in the subunit.

Effects from Special Designations

Under Alternative B, 621,000 acres would be designated as the Salmon Fork ACEC. This ACEC designation would help maintain or protect fish and wildlife habitat, potentially increasing fish and wildlife numbers, with beneficial impacts on fishing, wildlife viewing and hunting. Negative effects of ACEC designation could also result, if additional restrictions are placed on recreational activities (such as seasonal restrictions on OHV use) to reduce impacts on the recreation/resource base and other sensitive resource values of the region.

The Salmon Fork of the Black River would be recommended suitable for designation as “wild” under the Wild and Scenic Rivers Act. If designated by Congress, the effect of the inclusion of this river into the National Wild and Scenic Rivers System would ensure the protection and potential enhancement of the outstandingly remarkable wildlife values for which the river was identified, providing beneficial experiences for those individuals seeking wildlife and “wild” river related recreational opportunities.

4.6.2.2.4. Alternative C

Effects from Visual Resources

Effects would be the same as discussed under Alternative B for the Salmon Fork ACEC which would continue to be managed as VRM Class II with an objective to retain the existing character of the landscape. All remaining BLM managed lands (1,740,000 acres) within the subunit would be assigned VRM Class IV where the objective is to allow for management activities which could create major modifications to the existing character of the landscape. However, every attempt

would be made to minimize the impact of these activities through careful location, minimal disturbance and repeating the basic elements. There would be less protection for recreational activities that include scenic quality or naturalness as part of the experience.

Effects from Wilderness Characteristics

Under Alternative C, the Salmon Fork ACEC (621,000 acres) would be managed for the maintenance of wilderness characteristics. This would provide additional opportunity for those individuals seeking a primitive and unconfined recreation experience and would ensure that the opportunity remains available for future recreation users.

Effects from Locatable Minerals

Under Alternative C, 621,000 acres in the Salmon Fork ACEC (thirty-seven percent of BLM lands) would be open to locatable mineral entry, while the remaining 1,740,000 acres would be closed. However, no mineral exploration or development is anticipated due to the lack of access and low mineral values of the area. In the unlikely case that claims were staked in the subunit, the development of necessary infrastructure for mineral activities could compromise the experiences of those recreation users whose expectations include a high degree of solitude and tranquility, within a naturally-appearing landscape. Adverse impacts on recreation users could also arise from intrusive noise and altered viewsheds produced by mining equipment and OHVs that are used in mining operations.

Closing the Salmon Fork ACEC (621,000 acres) to fluid leasable minerals and solid leasable minerals would protect recreation resources and naturalness by not allowing surface-disturbing activities related to mineral development. All other BLM lands would be open to fluid leasable minerals and solid leasable minerals impacting recreation activities by development activities enhancing access but also causing surface disturbance in otherwise natural areas on 104,000 acres.

All BLM managed lands would be open to salable minerals and would impact recreation activities by development activities enhancing access but also causing surface disturbance in otherwise natural areas.

Effects from Travel Management

Effects would be similar to Alternative B except more area would be made available for recreational activities that involve the summer-use of motorized travel. Under this alternative summer use of OHVs weighing 1,500 pounds curb weight and less would be allowed in the Salmon Fork ACEC, providing beneficial access and experiences for those individuals seeking motorized hunting opportunities. This would provide a direct benefit to recreational hunters who could use OHV's to retrieve legally harvested big-game within the ACEC. This effect would likely be minimal, due to the low levels of motorized use likely to occur in the ACEC.

Effects from Special Designations

Under Alternative C, 621,000 acres would be designated as the Salmon Fork ACEC. Effects would be the similar to those discussed under Alternative B, except the summer use of OHVs weighing 1,500 pounds curb weight and less would be allowed in the ACEC, providing some opportunity for additional access and experiences for those individuals seeking motorized recreational experiences. Given the lack of access to the subunit and the remote location of the ACEC, this effect would likely be minimal.

4.6.2.2.5. Alternative D

Effects from Visual Resources

Under Alternative D, the entire subunit would be assigned a VRM Class IV. Compared to Alternatives B and C, this would result in less protection of important viewsheds for recreation activities that include scenic quality or naturalness as part of the experience. In contrast, fewer restrictions would be placed on OHV use in areas that possess increasing recreation demand.

Effects from Wilderness Characteristics

No lands within the subunit would be specifically identified for maintenance of wilderness characteristics. However, the remote nature of the subunit and low level of activity likely to occur would likely result in maintenance of wilderness characteristics on most of the subunit.

Effects from Locatable Minerals

Under Alternative D, the entire subunit (2,361,000 acres) would be open to locatable mineral entry. Although additional lands would be opened to entry, effects would essentially be the same as Alternative C.

Effects from Travel Management

Same as Alternative C.

Effects from Special Designations

Same as Alternative C.

4.6.2.2.6. Cumulative Impacts

The effects of past, present and future actions, including the demand for recreational use, changes to the landscape as a result of surface-disturbing activities, and area closures or restrictions for resource protection, could affect recreation management in the Upper Black River Subunit.

Surface-disturbances resulting from forestry and mineral activities could cumulatively affect recreational users if activities were concentrated in recreated areas and if activities overlapped in duration. Effects to recreation as a result of these cumulative effects may include the potential dislocation of wildlife for hunting and viewing purposes, and/or the alteration of scenic viewsheds.

Special designations, including ACECs and WSRs, would further protect the Upper Black River Subunit, by increasing wildlife numbers that benefit wildlife viewing, hunting, and fishing opportunities. As the size and scope of these areas increase, opportunities for land- and water-based recreation uses that incorporate scenic viewsheds as part of the experience would also increase. However, as areas that require special management attention, to prevent irreparable damage to historic, cultural and scenic values, the need for additional restrictions could limit OHV use and other recreational activities.

Implementing any of the alternatives would not contribute to a significant change to recreational opportunities on public lands.

4.6.2.3. Travel Management Upper Black River Subunit

Summary of Effects

Effects on travel management from the proposed alternatives would result in a narrow range of possible outcomes. Site-specific measures to protect and preserve sensitive resource values could result in restrictions or emergency closures, but are unlikely. Seismic exploration could affect travel management through the initiation of a transportation network.

Alternative A would provide the greatest range of motorized opportunities due to the lack of OHV designations. Alternative B would provide the least range of motorized recreation experiences. Alternatives C and D would provide the same range of opportunities. However, there would be little difference between the alternatives due to the lack of access and the distance from population centers. Recreational users seeking a motorized experience are more likely to recreate in areas closer to Fairbanks.

Table 4.16. Comparison of OHV Designations by Alternative: Upper Black River Subunit

Area Designation	Alternative			
	A (acres)	B (acres)	C (acres)	D (acres)
Undesignated	2,361,000	0	0	0
Limited: no summer OHV use	0	621,000	0	0
Limited: summer OHV use 1,500 pounds curb weight and less	0	1,740,000	2,361,000	2,361,000
Limited: Winter OHV use 1,000 pounds curb weight and less	0	2,361,000	2,361,000	2,361,000

4.6.2.3.1. Effects Common to All Alternatives

Effects from Locatable Minerals

Mineral development through suction dredging or placer mining activities has the potential to affect travel and transportation management by expanding the travel network. However, no locatable mineral activity is anticipated under any alternative due to the lack of mineral potential and access. Therefore, no effects would occur.

Effects from Recreation Management

Recreation management would be the same in all alternatives and effects on Travel Management would be minimal. The Upper Black River Subunit is essentially being managed as undesignated BLM managed lands. The management approach would be custodial in nature, meaning resource allocations of capital and manpower would be minimal and to protect identified sensitive and valuable resources as directed by federal guidance and policy. Where recreation activities associated with Travel Management cause resource damage, an assessment will determine whether the area should be closed to the surface-disturbing activities or a sustainable route developed to protect sensitive or valuable resources. Currently, recreational use of the area is very low and this is expected to remain the case over the life of the plan.

4.6.2.3.2. Alternative A (No Action)

Effects from Leasable Minerals

There would be no effect to Travel Management because the entire subunit is withdrawn from the mineral leasing laws. No leasing or exploration would occur.

Effects from Travel Management

Under Alternative A, there are no OHV designations and motorized use is unrestricted. There are no travel management decisions in place, so there would be no effect.

4.6.2.3.3. Alternative B

Effects from Leasable Minerals

Under Alternative B, the entire subunit would remain closed to leasable and locatable minerals. Effects would be the same as Alternative A. Only the Salmon Fork ACEC (621,000 acres) would be open to salable minerals.

Effects from Travel Management

Under Alternative B, the subunit would be under a limited OHV designation. This designation would include a limitation of 1,000 pounds curb weight and less for winter OHV use and 1,500 pounds curb weight and less for summer OHV use. Also no summer OHV use would not be allowed in the Salmon Fork ACEC (621,000 acres). Use of aircraft and motorized boats would be unrestricted. The effect of these limitations would be minimal as the subunit is generally inaccessible except by boat, aircraft, or snowmobile. If user-created routes occur and result in resource damage, sustainable trail construction or area closures could occur.

Effects from Special Designations

Under Alternative B, the Salmon Fork ACEC (621,000 acres) would be designated. The ACEC would be closed to summer OHV use. Summer use of OHVs by federally qualified subsistence users could be authorized by permit, but is not anticipated. Most subsistence access is by boat or snowmobile. Management of the ACEC for protection of fish and wildlife values could effect travel and transportation management if additional restrictions were placed on OHV use. However, impacts to travel are expected to be negligible, as the ACEC is remote and difficult to access, and the most likely forms of motorized access (boat, snowmobile, or aircraft) are not restricted.

The Salmon Fork of the Black River would be recommended suitable for designation as “wild” under the WSR Act. The river would be managed to preserve its outstandingly remarkable wildlife values. This could conceivably result in some future limitations on motorized travel in the river corridor. These impacts would be minor because the area is so remote and difficult to access, visitation would be low and the types of motorized vehicles used in the corridor would likely be limited to boats and snowmobiles.

4.6.2.3.4. Alternative C

Effects from Minerals

Under Alternative C, the Salmon Fork ACEC (621,000 acres) would be closed to leasable minerals, but open to locatable minerals. The rest of the subunit would be open to leasable minerals. The entire subunit would be open to locatable minerals. Seismic exploration could occur on high potential oil and gas areas near Circle (Map 96) but no leasing or development is anticipated. If seismic exploration occurred and woody vegetation was cleared along seismic trails, these routes could be used as the beginning of a route network of winter trails, potentially increasing access into the southern part of the subunit. These effects would be minimal, as at most 20 miles of seismic route is anticipated.

Effects from Travel Management

Effects would be the same as Alternative B, except summer OHV use of 1,500 pounds curb weight and less would be allowed in the Salmon Fork ACEC.

Effects from Special Designations

Effects would be the same as Alternative B except summer OHV use would be allowed in the Salmon Fork ACEC. There would be no effect on Travel Management from WSRs because no rivers would be recommended as suitable for designation under the WSR Act.

4.6.2.3.5. Alternative D

Effects from Minerals

Same as Alternative C.

Effects from Travel Management

Same as Alternative C.

Effects from Special Designations

Same as Alternative C.

4.6.2.3.6. Cumulative Impacts

With increased pressures from growing populations and advances in recreational vehicle technology, the Upper Black River Subunit may experience growth in travel-related land use and activity participation. If this occurs, the need for additional trails and mechanisms for managing these trails will become necessary. However, growth of OHV use would be limited as the subunit is inaccessible from existing roads and highways, is located north and east of the Yukon River, consists of terrain that is generally not suitable for summer OHV use, and is bordered by National Park Service lands on the south and National Wildlife Refuge lands on the north. The Yukon River is a barrier to summer access by OHVs, and use of OHVs on Yukon-Charley Rivers National Preserve and Yukon Flats NWR are limited.

Additional cumulative impacts are discussed in section 4.3.2.7 Travel Management, Impacts Common to All Subunits.

4.6.3. Special Designations

4.6.3.1. Wild and Scenic Rivers Upper Black River Subunit

Summary of Effects

There are currently no rivers designated within the National Wild and Scenic River System (NWSR) within the Upper Black River Subunit. Alternative B is the only alternative where river segments are recommended for inclusion to the NWSR. The Salmon Fork of the Black River is recommended suitable for designation as “wild” with outstandingly remarkable wildlife population and habitat values.

Management actions that protect the naturalness of the landscape such as wilderness characteristics, protection of fish and wildlife habitats, protection of vegetation, and recreation management that manages for more primitive experiences will help protect many of the possible Outstandingly Remarkable Values of river systems.

4.6.3.1.1. Alternative A (No Action)

Under Alternative A, no river segments are identified as suitable for inclusion to the NWSR. The BLM would not recommend that Congress designate any river segments.

4.6.3.1.2. Alternative B

In general, Alternative B anticipates a low level of resource development and is the only alternative where river segments are determined to be suitable for inclusion to the NWSR. The BLM would recommend that Congress designate one river segment. This recommendation would influence the Congressional decision and increase the likelihood of permanent legislative protection. Decisions are evaluated for effect on identified Outstandingly Remarkable Values, free-flowing character and water quality.

Through the Wild and Scenic Rivers Inventory (Appendix E, *Wild and Scenic Rivers Inventory*) the BLM has determined which rivers and streams are suitable for inclusion in the NWSR. The Salmon Fork in the Upper Black River Subunit was determined to be suitable with a classification of “wild” and outstandingly remarkable wildlife values. Any segment determined to be suitable must be managed for the protection of its Outstandingly Remarkable Values and free-flowing nature until such time as Congress acts upon the determination finding and either designates the river segment or removes it from consideration. If the segment is removed from consideration by Congress, the BLM would manage the segment according to the management provisions of the RMP. The determination of suitable is a policy determination.

Effects from Cultural and Paleontological Resources

Surface-disturbing activities (e.g., site excavation) have the potential to directly and indirectly impact water quality.

Effects from Fish and Aquatic Species

The identification of the three watersheds on the Salmon Fork of the Black River as Riparian Conservation Areas (Map 11) may have indirect impacts to water quality.

Effects from Soil, Vegetation, and Water Resources

Management of soil resources, vegetative communities, and watersheds for a properly functioning condition within riparian zones, uplands, wetlands and aquatic areas would directly and indirectly enhance water quality.

Effects from Visual Resources

“Wild” river segments would be managed as a VRM Class I with the objective to preserve the existing character of the landscape and provide for natural ecological changes. Very limited management activities may occur where the level of change to the characteristic landscape is very low and must not attract attention.

Effects from Wilderness Characteristics

The maintenance of wilderness characteristics would indirectly protect the free-flowing characteristics and water quality.

Effects from Wildland Fire Ecology and Management

Wildland fires have the potential to destroy or harm habitat and populations of outstandingly remarkable wildlife values.

Effects from Wildlife

Management of a naturally functioning ecosystem would directly and indirectly protect outstandingly remarkable wildlife population and habitat values and water quality.

Effects from Lands and Realty

Consolidation of land ownership could indirectly enhance water quality by acquisition of lands adjacent to the headwaters of the river segment. Land use authorizations, such as leases and rights-of-way, could directly and indirectly impact outstandingly remarkable wildlife population values, directly impact free-flowing characteristics and indirectly impact water quality if authorized across or along the river segments. Closing 2,361,000 acres to locatable minerals would directly protect water quality, free-flowing characteristics and naturalness of the river segment.

Effects from Travel Management

Unrestricted non-motorized travel could directly impact water quality with the development of social travel routes. Unrestricted aircraft landings could indirectly impact water quality and outstandingly remarkable wildlife population values by allowing motorized access to remote areas.

Unrestricted winter motorized overland travel by OHVs weighing 1,500 pounds curb weight and less could indirectly impact water quality and outstandingly remarkable wildlife population values by allowing motorized access to remote areas. Closing the corridor to summer OHV use could indirectly enhance water quality and outstandingly remarkable wildlife population values by restricting motorized access to remote areas.

Effects from Special Designations

Designation and management of 621,000 acres within the Salmon Fork watershed as the Salmon Fork ACEC would protect outstandingly remarkable wildlife population and habitat values and indirectly enhance water quality due to limitations and restrictions on development.

The Salmon fork of the Black River, totaling 52 miles and approximately 15,000 acres would be recommended for designation to the NWSR. The designation of this river by Congress would provide for greater protection of overall river values and of outstanding remarkable river values specifically. The amount of protection is dependent on the classification of the river segment. Management of suitable rivers would be coordinated with the State of Alaska.

Effects from Hazardous Materials

Environmental remediation activities such as the removal of surface or buried wastes from abandoned sites and removal of contaminated soils could enhance directly and indirectly water quality and outstandingly remarkable wildlife population values depending on the location of these activities.

Effects from Subsistence

Harvest of subsistence resources such as timber and other forest products may impact directly and indirectly the outstandingly remarkable wildlife population values if collection of these resources occurs at within the river corridor.

4.6.3.1.3. Alternative C

Same as Alternative A.

4.6.3.1.4. Alternative D

Same as Alternative A.

4.6.3.1.5. Cumulative Impacts

Past, present and reasonably foreseeable actions that are relevant to Wild and Scenic Rivers management include oil and gas exploration, increases in motorized use on both water and adjacent lands, utility and transportation rights-of-way, recreation use, travel management, and use restriction to protect wildlife, fisheries and vegetative resources.

Cumulative effects will accrue from BLM management decisions in addition to activities on surrounding lands during and beyond the life of the plan. Much of the surrounding land base is other federal lands; however, there are Native lands within the watershed and the headwaters is in Canada. Development of lands along waterways could have an indirect impact on other rivers by increasing the importance of river related values of free-flowing, water quality, scenic, recreation, geologic, fish and wildlife habitats and populations, cultural and historic on those other rivers.

Designation and management of the Salmon Fork ACEC and maintenance of wilderness characteristics, as well as measures to protect other resource values on adjacent federal lands would help protect river values. Proposed and current management in these areas would limit development and help maintain a more natural ecosystem with benefits to water quality and other river related values.

There are no existing components of the NWSR in the Upper Black River Subunit. Protection of river related values along eligible rivers in the subunit, the Yukon, Kandik, and Nation rivers, managed by the National Park Service, would continue until a decision is made by Congress to not add them to the NWSR. Protection of river related values along the proposed addition of the Salmon Fork of the Black River, with outstandingly remarkable wildlife values, would continue if designated by Congress. The BLM and other agencies could implement other means to protect river values if these segments are not included in the system.

4.6.4. Social and Economic

4.6.4.1. Economics Upper Black River Subunit

Summary of Effects

The economic effect in the Black River Subunit would be low. The primary effect would be from seismic exploration under Alternatives C and D.

4.6.4.1.1. Effects Common to All Alternatives

In addition to the effects discussed as common to all subunits in section 4.3.3.1 the following effects would occur in the Upper Black River Subunit.

The BLM assumes no locatable mineral mining or associated economic effects would occur in the Upper Black River Subunit during the life of the plan. Recreation use is expected to grow slowly with increased population in the region. Economic effects would be correspondingly low for all alternatives.

4.6.4.1.2. Alternative A (No Action)

Under Alternative A, economic effects would be limited to increase in currently allowed economic activities resulting from population growth. Since all BLM lands are currently are withdrawn from locatable mineral entry and leasing, there would be no economic effect from mining.

4.6.4.1.3. Alternative B

Under Alternative B, the entire Upper Black River Subunit would remain closed to locatable minerals and mineral leasing. There would be no economic effect, same as Alternative A.

4.6.4.1.4. Alternative C

Under Alternative C, one-hundred percent of the Upper Black River Subunit would be open to locatable minerals and seventy-four percent would be open to mineral leasing. Although, the entire subunit would be opened to locatable minerals, no mining activity is anticipated due to the lack of mineral potential and lack of access. Therefore, economic effects would be low.

Seismic exploration for oil and gas could occur on high occurrence potential oil and gas lands, but is unlikely during the life of the plan. Roadless exploration, in the form of seismic surveys, would occur in the winter after the tundra is frozen. Summer field sampling and reconnaissance would occur in using helicopter support.

Non-BLM lands in the Yukon Flats Basin could have approximately 130 to 212 2D or 3D line miles shot every five years. Initially, 2D seismic would be collected, followed by 3D to identify potential reservoirs. The number of line miles shot on BLM lands, including those in this subunit, would be less than 20 miles.

Jobs created during the seismic surveys could include: Superintendent, surveyors, recording crew, and caterers. Professional and technical employment in interpretation of survey findings would also occur outside the planning area. However, it is unlikely that additional jobs would result from exploration on the BLM lands. The resulting additional taxes would be slight. See Table 4.14, “Estimated Employment from Seismic Surveys”.

4.6.4.1.5. Alternative D

The effects from locatable minerals would be the same as Alternative C. The opening of additional acreage to mineral leasing would have no additional economic effect over Alternative C due to the low oil and gas potential. The effects from seismic exploration for oil and gas would be the same as Alternative C.

4.6.4.2. Environmental Justice Upper Black River Subunit

Summary of Effects

Effects to Environmental Justice populations in the Black River Subunit would be low under all Alternatives. Under Alternatives B, C, and D increases in recreation use could add income for the local population in villages of Beaver, Birch Creek, Chalkyitsik, Circle, Stevens Village, and Fort Yukon. If seismic survey activity occurred under Alternatives C and D, there would be little effect on Environmental Justice populations.

4.6.4.2.1. Effects Common to All Alternatives

The BLM assumes no locatable mineral mining or associated economic effects would occur in the Upper Black River Subunit during the life of the RMP. Increases in recreation use could add income for the local Environmental Justice populations, if residents provide guiding or interpretive services.

4.6.4.2.2. Alternative A (No Action)

There would be no effects to the Environmental Justice population under Alternative A.

4.6.4.2.3. Alternative B

Under Alternative B, commercial outfitting or guiding permits issued by the BLM are expected to remain near the current level. Effects to the Environmental Justice population would be correspondingly low.

4.6.4.2.4. Alternative C

Under Alternative C, seismic exploration for oil and gas could occur, but is unlikely during the life of the plan. Therefore little effect on the Environmental Justice population would be anticipated.

See Table 4.14, “Estimated Employment from Seismic Surveys” Estimated Employment Generated by Seismic Surveys for discussion of jobs resulting from work on BLM-managed lands. Effects from recreation would be the same as Alternative B.

4.6.4.2.5. Alternative D

Under Alternative D, environmental justice effects related to oil and gas and recreation would be essentially the same as Alternative C.

4.6.4.3. Social Conditions Upper Black River Subunit

Summary of Effects

Most impacts to individuals and groups are minor to moderate in part because other opportunities exist for the activities within the planning area and on nearby lands managed by the State of Alaska or a Native corporation. While it is possible for impacts for multiple resources to adversely affect individuals and groups in a cascading fashion, most nearby communities exhibit sufficient resiliency to adapt to change.

All individual programs would have minimal net positive or negative effect to social conditions and are not analyzed further. For further discussion, see Effects Common To All Alternatives in all Subunits.

4.6.4.4. Subsistence Upper Black River Subunit

Summary of Effects

The Upper Black River Subunit is extremely remote. Current uses of BLM lands consist primarily of subsistence and casual recreation use. Potential impacts to subsistence resources and uses include user conflicts, displacement of resources, and potential declines in resource availability due to disturbance in critical habitats or during critical times (e.g., calving periods). Where resources are limited, federally qualified subsistence users would have priority use (ANILCA Title VIII § 802(2)).

Lifetime use of resources by local subsistence users/consumers in the Upper Black River Subunit is documented by Caulfield (1983) and Sumida and Andersen (1990).

Subsistence fishing on BLM lands in the Upper Black River Subunit has been documented by Caulfield (1983) to occur along the Salmon Fork and near the confluence of Bull Creek with Grayling Creek. The Salmon Fork ACEC encompasses the fishing areas identified along Salmon Fork but not in the Grayling Creek area (Maps 77 and 111). Land use activities permitted in the subunit, such as development of transportation routes and locatable minerals, may affect water quality at downstream locations, fish spawning or rearing areas; indirectly impacting subsistence fisheries harvested off BLM-managed lands. Stipulations to mitigate impacts to water quality and fish spawning and rearing areas are attached to land use permits as appropriate. No impacts to subsistence fishery resources or uses in or adjacent to BLM-managed lands are expected from the alternatives.

Black and brown bear, caribou, moose, furbearers and small game are recognized as subsistence wildlife resources in the subunit. Residents of Fort Yukon report harvesting moose on

BLM-managed lands along the Salmon Fork, Tetthajik Creek and lower Wood River (Sumida and Andersen 1989). Residents of Chalkyitsik report trapping for furbearers within the Grayling Fork and Runt Creek drainages, harvesting moose and bears along the Salmon Fork and Grayling Fork and harvesting caribou in the Grayling Fork drainage (Caulfield 1983). Much of the subsistence use areas on BLM-managed portion of the subunit is within the proposed ACEC. Management decisions vary by alternative in the ACEC and other BLM-managed lands and therefore impacts differ.

Some land use decisions under the alternatives may potentially impact vegetative communities and indirectly impact subsistence fish and wildlife resources harvested on and off BLM-managed lands. These will be discussed under the resource uses in the following sections. Forest resources on BLM-managed lands may also cause impacts however little or no use of wood or forest products has been documented.

No applications for rights-of-way have been received and few requests are anticipated over the life of the plan. Impacts from other land use activities are discussed under the common to all alternatives or by alternative.

4.6.4.4.1. Effects Common to All Alternatives

In addition to effects discussed under Impacts Common to All Subunits (section 4.3.3.4 Subsistence), the following effects would occur in the Upper Black River Subunit.

Effects from Forest and Woodland Products

Based on existing data, primarily from Caulfield (1983), timber is harvested along the Black River east and west of the community of Chalkyitsik primarily on Yukon Flats NWR lands. Woodland products are harvested along the Grayling Fork Black River, including a small area of BLM-managed lands. Caulfield (1983) indicates that Fort Yukon and other communities harvest timber, including firewood and house logs, berries, bark and other forest plant materials in the upper Black River area but not on BLM-managed lands.

Caulfield (1979) documents no subsistence harvest of firewood, house logs, or timber on BLM lands by residents of Circle. However, it is likely that residents of Circle are harvesting these resources on the BLM lands surrounding the village, and may request free-use permits to do so. This area is open to free-use permits under all alternatives. Requiring a free-use permit to harvest timber products for subsistence use is considered a reasonable regulation.

Personal use of timber products and commercial use of forest products would be allowed throughout the subunit under all alternatives. Commercial timber and salvage timber sales would be prohibited in the subunit under Alternative B. Commercial sales could be considered under Alternatives C and D. However, demand for commercial and salvage timber sales is expected to be minimal to nonexistent because of the remoteness of the area and the lack of commercially valuable timber.

Effects from Leasable Minerals

Most of the BLM lands in the subunit have no or low potential fluid leasable minerals. No fluid mineral leasing or development is anticipated, although seismic exploration may occur under some alternatives. The Salmon Fork ACEC would be closed to mineral leasing under Alternative C.

No potential for solid leasable minerals has been identified in the subunit. Although coal screening may be conducted to further determine development potential, development would not occur under this plan. No impacts to subsistence uses or resources are anticipated from solid leasable minerals.

Effects from Salable Minerals

Although the amount of land available for salable minerals varies slightly by alternative, no demand for salable minerals is anticipated over the life of the plan. Thus no effects are anticipated under any alternative.

Effects from Recreation

Recreation occurs at low levels in the Upper Black River Subunit. There are no developed sites associated with recreational activities on BLM lands and none are anticipated over the life of the plan. Most recreational use occurs during hunting seasons, primarily August and September. The current and reasonably foreseeable level of recreation in the subunit will not significantly impact subsistence resources or uses in the subunit.

Effects from Travel Management

Travel management prescriptions allow unrestricted boat, aircraft, and non-motorized use, and cross-country winter use of snowmobiles (1,500 pounds curb weight and less) throughout the subunit under all alternatives. Cross-country summer use of OHV 1,500 pounds curb weight and less would be allowed throughout the subunit, except in Alternative B where no summer OHV use would be allowed within the Salmon Fork ACEC. Permits would be required for any OHV over 1,500 pounds curb weight. For those uses requiring a permit, stipulations would be used to mitigate impacts to subsistence resources and uses.

Boat and winter cross-country snowmobile travel is expected to be local and mostly in support of subsistence activities. Some use by recreational aircraft would be expected, mostly during state hunting seasons.

With projections for population growth and advances in recreation vehicle technology increased demands in travel-related land use are expected to occur across the planning area. Growth would be limited in the Upper Black River Subunit because there are no existing highways, the Yukon River presents a barrier, and terrain is not suitable for summer cross-country use of OHVs. Impacts to subsistence resources and uses from motorized and non-motorized use under all alternatives would be minimal.

Effects from Special Designations

In general the Salmon Fork ACEC will benefit subsistence resources and uses through heightened attention to maintaining fish and wildlife values within the designated area. The Salmon Fork ACEC was created to protect salmon spawning habitat and Porcupine caribou migration and wintering areas. The location and size of the ACEC is constant throughout the action alternatives.

4.6.4.4.2. Alternative A (No Action)

Present land management practices and levels of resource used would continue in accordance with existing laws, regulations and policy. Land use activities would continue to be analyzed

through the NEPA process and include ANILCA Title VIII Section 810 evaluations. Through these processes, appropriate stipulations would be developed to mitigate any impacts identified.

OHV use is unrestricted in the subunit. No recreation management areas, RNA, ACEC or WSR designations exist. The subunit is extremely remote and ongoing uses of BLM-managed lands consist primarily of subsistence or casual recreation use.

Effects from Forest and Woodland Products

All types of forest product and timber uses could be considered throughout the subunit. In the past, demand for commercial forest products and timber has been nonexistent because of the remoteness of the area. Future demand for commercial uses is expected to be nonexistent to low. Impacts to subsistence resources and uses are expected to be negligible.

Effects from Lands and Realty

There would be no effects from changes in land tenure as no lands are identified for disposal. Land use authorizations would be considered throughout the subunit. Few requests for land use authorizations would be expected. Little or no adverse impacts to subsistence from these decisions are anticipated.

Effects from Leasable and Locatable Minerals

The entire subunit is withdrawn from mineral entry and leasing. There are no existing mining claims. Thus there would be no impacts to subsistence resources and uses from leasable or locatable minerals.

4.6.4.4.3. Alternative B

Effects from Forest and Woodland Products

Personal use of timber and commercial use of forest products would be allowed throughout the subunit. Commercial timber sales and salvage sales would not be allowed. Demand for commercial forest products and personal use timber is expected to be minimal to nonexistent because of the remoteness of the area and lack of commercially valuable timber. Impacts to subsistence resources and uses are expected to be negligible.

Effects from Lands and Realty

Under Alternative B the Salmon Fork ACEC would be retained. Private inholdings may be acquired from willing sellers. Parcels intermingled with Native village lands around Circle would be considered for acquisition or disposal for the purposes of consolidating land ownership. Consolidation of scattered parcels will simplify land status and benefit management and continued uses of subsistence resources. No adverse impacts are expected from these actions.

The Salmon Fork ACEC would be a right-of-way avoidance area. Subsistence resources could benefit from this designation due to reduced disturbance from construction and maintenance activities or fragmentation of habitat, which can occur from rights-of-way development. Requests for rights-of-way in the rest of the subunit would be considered at the project level, allowing for mitigation of impacts to subsistence resources and uses. Few requests for rights-of-way would be expected. Little or no adverse impacts to subsistence from these decisions are anticipated.

Effects from Leasable Minerals

Under Alternative B the entire subunit would be closed to fluid and solid mineral leasing to maintain wilderness characteristics. The effect would be positive for subsistence resources and uses.

Effects from Locatable Minerals

The entire subunit would be closed to locatable minerals under Alternative B.

4.6.4.4. Alternative C

Effects from Forest and Woodland Products

Under Alternative C, timber salvage sales and commercial timber sales would be allowed, except in the Salmon Fork ACEC. Impacts to subsistence resources and uses are expected to be negligible.

Effects from Lands and Realty

Decisions and impacts from land tenure changes would be the same as Alternative B.

No right-of-way avoidance area would be designated under Alternative C. Requests for rights-of-way would be considered at the project level, allowing for mitigation of impacts to subsistence resources and uses. Few requests for rights-of-way authorizations would be expected. Little or no adverse impacts to subsistence are anticipated from these decisions.

Effects from Leasable Minerals

The Salmon Fork ACEC (21,000 acres) would be closed to leasable minerals. The remaining BLM-managed lands would be open to leasable minerals under Alternative C with differing levels of constraints. Geophysical (seismic) exploration for oil and gas could be permitted on high potential lands near Circle. Impacts would be minimal and would be mitigated through ROPs and permit stipulations.

Effects from Locatable Minerals

The Salmon Fork ACEC would be open to locatable minerals. The remaining lands in the subunit would also be open. However, mineral potential is low, access is poor, and no mining activity is anticipated. Impacts to subsistence resources would be minimal or nonexistent.

4.6.4.5. Alternative D

Effects from Forest and Woodland Products

Alternative D is the same as Alternative C except commercial timber sales would be allowed in the Salmon Fork ACEC. Sales would be considered at the project level. Although based on historic and current subsistence use patterns in the subunit no forest or woodland products are harvested in the ACEC, winter habitat for Porcupine Herd Caribou could be impacted by commercial timber harvest. Timber in this area is not considered marketable, largely due to the distance to market, and it is very unlikely that a commercial sale would occur in this area over the life of the plan. No significant impacts to subsistence resources would therefore be expected.

Effects from Land and Realty Actions

Same as Alternative C.

Effects from Leasable Minerals

All BLM lands, including the Salmon Fork ACEC, would be open to leasable minerals with differing levels of constraints. Due to low potential for leasable minerals, impacts to subsistence resources would be the same as Alternative C.

Effects from Locatable Minerals

Effects will be the same as Alternative C.

4.6.4.4.6. Cumulative Effects

The cumulative effects of past, present and future actions in the Upper Black River Subunit are not likely to impact subsistence resource or uses over the life of the plan. The remoteness of the area, lack of overland access and costs of developing resources, other than those that would be used by local residents in or adjacent to the subunit, render it unlikely that locatable or salable mineral, or commercial forest sales would occur during the life of this plan. Rights-of-way development would be driven by resource development. No proposed exploration, development, access or other rights-of-way are currently under consideration on BLM-managed lands in the subunit. No new proposals, other than perhaps oil and gas exploration in the Circle area, are expected. Further discussions of the cumulative case within the subunit are in section J.2.3.5 Appendix J, *ANILCA Section 810 Analysis*.

4.7. Impacts Specific to the White Mountains Subunit

4.7.1. Resources

4.7.1.1. Cultural and Paleontological Resources White Mountains Subunit

Summary of Effects

See section 4.3.1.3 Effects Common to All Alternatives, Impacts Common to All Subunits.

4.7.1.1.1. Effects Common to All Alternatives

In addition to those resources, resources uses, and programs listed as having no effects on cultural and paleontological resources in section 4.3.1.3, the Locatable Minerals program would have only minimal effects under all alternatives in the White Mountains Subunit. At present, direct and indirect adverse effects from the locatable minerals program on cultural and paleontological resources occur only on existing, valid mining claims, of which there are 4,000 acres in the Livengood area, outside of the White Mountains NRA and the Beaver Creek WSR Corridor. All lands in the subunit are presently withdrawn from mineral entry and leasing under ANCSA 17(d)(1). Even if ANCSA withdrawals are revoked, these areas would remain closed under all alternatives under ANILCA. Thus, no new mining claims would be staked. Most if not all locatable mineral mining that is presently occurring is surface-disturbing, open-air mining, and not underground mining which is accessible through shafts and adits that would otherwise leave the upper ground surface undisturbed.

Assumptions for locatable minerals for all four alternatives in the White Mountains Subunit indicate no suction dredge operations in any given year, three small-scale placer mines, and one large-scale placer mine. This equates to 120-170 acres of disturbed ground, in areas that very likely contain evidence of prior, historic mining operations, which have occurred throughout different drainages in the subunit for at least 100 years. Disturbance to prehistoric sites by any particular operation would have to be assessed on a project-specific basis. None of this disturbance would be within the White Mountains NRA.

New access roads are often needed to access mining claims. The construction of new roads not only has a direct and adverse effect on cultural and paleontological resources, but would also have an indirect effect by providing new access to previously isolated lands. With more resource users accessing the area, there would be an increased potential of more people finding surface cultural resources and adversely impacting them, either intentionally or unintentionally. In sum, locatable mineral mining would likely directly and adversely impact all manner of cultural and paleontological resources on only a limited amount of land (4,000 acres) outside the White Mountains NRA.

4.7.1.1.2. Alternative A (No Action)

Effects from Lands and Realty

Two transportation corridors were established in the White Mountains NRA to allow access to potential minerals deposits. All rights-of-way will, as far as possible, be located in one of these corridors. Outside of the NRA, rights-of-way are considered anywhere, although existing trails

and roads will be followed to the extent possible. In the White Mountains Subunit, this is primarily limited to federal mining claims near Livengood.

The approval of new roads or trails either within or outside of these transportation corridors, as with all such surface-disturbing activities, would have the potential to directly and adversely impact cultural and paleontological resources. In addition, there could be an indirect effect on surficial cultural resources; with the creation of new routes of access, more resource use permittees would have access to BLM-managed lands which were previously inaccessible. There would be an increased potential of more people finding surface cultural resources and potentially adversely impacting them, either intentionally or unintentionally.

Effects from Recreation

At present, a wide range of recreational opportunities are available and/or are authorized in the White Mountains Subunit including: established campgrounds, private and commercial floating in the Beaver Creek WSR, all-season motorized and non-motorized overland travel on 220 miles of established trails, 12 public use cabins, staging areas, and waysides. The construction of infrastructure to support these activities can be ground disturbing, and thus can potentially directly affect cultural and paleontological resources. Also, visitors to the public lands have the potential to inadvertently find surficial cultural and paleontological resources, and thus have the potential to adversely impact such resources, either intentionally or unintentionally.

Effects from Travel Management

The current OHV designation for the White Mountains NRA is Limited except for RNAs, which are Closed. Generally, OHV use is allowed in Limited area designations in all seasons off of existing trails.

The BLM assumes ever increasing travel visitation and use, both motorized and non-motorized, on the land it manages in the White Mountains Subunit, with OHV use accounting for much of travel-related activities. The current visitation rate of increase is approximately five percent per year, which is expected to continue for the life of the plan. At this rate, travel visitation in the subunit is expected to double within the next 15 years. Additional trails and mechanisms for managing these trails are needed. Construction of new trails, whether authorized or not, like any other surface-disturbing activities, have the potential to directly and adversely affect cultural and paleontological resources.

The construction of new trails also has an indirect effect by providing new access to previously isolated lands. With more resource users accessing BLM-managed lands, there would be an increased potential of more people finding surface cultural resources and adversely impacting them, either intentionally or unintentionally.

4.7.1.1.3. Alternative B

Effects from Lands and Realty

Alternative B would have the same direct and indirect effects as Alternative A, relative to the construction of new trails in the White Mountains NRA, new access to mining claims in the Livengood area, and land tenure decisions. Only the Nome Creek transportation corridor would be retained. However, since few rights-of-way other than those associated with BLM's development of recreational facilities are anticipated, the reduction to one designated corridor per

se is not expected to result in any additional effects to cultural or paleontological resources. This alternative also considers acquiring private land in-holdings from willing sellers. The effect of acquiring this property would be that cultural resources on the previously private parcels (166 acres) would be protected under federal laws.

Effects from Recreation

A wide range of recreational opportunities would be available and/or authorized under Alternative B, in which the White Mountains Subunit is divided into the SRMA (1,016,000 acres) and about 4,000 acres of undesignated land near Livengood. The White Mountains SRMA includes the White Mountains NRA, the Beaver Creek WSR, and associated staging areas and recreation sites. The SRMA would be divided into seven RMZs, each with a well defined "setting character," ranging from Primitive, to Semi-Primitive, to Backcountry, to Middlecountry, to Frontcountry. The recreation management objectives associated with each of these RMZs are well defined, with differing emphases on building and maintaining facilities and trail, to varying permissible OHV uses.

Construction of public and administrative facilities by the BLM to meet recreational demand can directly and adversely impact surface and subsurface cultural and paleontological resources. The BLM assumes a ten to fifteen percent increase over the life of the plan in demand for recreational users and visitation (both motorized and non-motorized), resource damage, and user-resource conflicts. Any increased visitation to the public lands has a concurrent potential increase for inadvertently finding surficial cultural and paleontological resources and adversely impacting such resources, either intentionally or unintentionally.

Effects from Travel Management

Under Alternative B, a comprehensive travel management network would be defined for the White Mountains Subunit (Appendix B, *Travel Management Plan: White Mountains*). In sum, 27,000 acres would be designated as Closed to motorized use in all seasons, but open to all means of non-motorized use. All other lands in the subunit permit some level of OHV use. Summer OHV use in Limited areas, would be limited to designated trails, a significant difference from Alternative A. Limiting summer OHV use to designated trails would greatly reduce overall surface disturbance and the proliferation of unauthorized trails. This action would reduce potential direct and indirect effects to cultural and paleontological resources, relative to Alternative A.

Effects from increasing visitation rates and construction of new trails would be the same as Alternative A.

4.7.1.1.4. Alternative C

Effects from Lands and Realty

Alternative C would have the same direct and indirect effects as Alternatives A and B, relative to the construction of new trails in the White Mountains NRA, new access to mining claims in the Livengood area, and land tenure decisions. Alternative C would be the same as Alternative B, except no transportation corridors would be designated. However, since few rights-of-way other than those associated with BLM's development of recreational facilities are anticipated, the lack of designated corridors per se is not expected to result in any additional effects to cultural or paleontological resources.

Effects from Recreation

Alternative C is overall very similar to Alternative B, except there are more acres in Middlecountry and Backcountry RMZs and less acres in Semi-Primitive RMZ. There would be a concomitant rise in potential adverse effects on cultural and paleontological resources under Alternative C because more ground-disturbing recreational infrastructural development would be permitted.

Effects from Travel Management

Same as Alternative B, except for some minor alterations to specific trail section use, and the addition of cross-country game retrieval with OHVs in specific areas. This would result in a potential for slightly greater effects to cultural and paleontological resources from off-trail OHV use relative to Alternative B.

4.7.1.1.5. Alternative D

Effects from Lands and Realty

Same as Alternative C, except the 200-acre recreation withdrawal at Perhaps Creek would be revoked, allowing it to be conveyed to the state. This change would slightly increase the potential of impacts to any cultural and paleontological resources present on this specific site, as surface-disturbing development activities could be more likely to occur.

Effects from Recreation

Effects would be essentially the same as Alternative B, except there would be even more acres managed for Middlecountry and Backcountry settings and fewer acres in Semi-Primitive settings in Alternative D. There may be a greater emphasis on construction of BLM facilities and trails, resulting in a slightly increased potential for adverse effects to cultural resources.

Effects from Travel Management.

Same as Alternative A.

4.7.1.2. Fish and Aquatic Species White Mountains Subunit

Summary of Effects

Fish and aquatic resources would be primarily affected by surface-disturbing activities (such as trail construction) which alter stream channels, remove or damage riparian vegetation, or result in soil erosion and sedimentation to fish and aquatic habitat. The level of impact would depends on the success and adequacy of protective measures, but would generally be minor under all alternatives, as trails would be designed to avoid impacting aquatic habitat and the entire subunit would be closed to locatable mineral entry.

Table 4.17. Stream Miles and Acres Open to Locatable Mineral Entry, White Mountains Subunit

WHITE MOUNTAINS SUBUNIT (BLM-managed lands)	ALTERNATIVES			
	A	B	C	D
Stream miles	1,723	1,723	1,723	1,723
Stream miles open to locatables (proposed)	0	0	0	0

WHITE MOUNTAINS SUBUNIT (BLM-managed lands)	ALTERNATIVES			
	A	B	C	D
Stream miles open to locatables (proposed) plus miles within current valid federal claims	10	10	10	10
Stream miles within RCAs in areas open to locatables (proposed)	0	0	0	0
Stream miles outside RCAs in areas open to locatables (proposed)	10 (100%)	10 (100%)	10 (100%)	10 (100%)
Acres open to locatables (proposed)	0	0	0	0
Acres open to locatables (proposed) plus miles within current valid federal claims	3,500	3,500	3,500	3,500
Anticipated stream gravel disturbance by suction dredging during life of plan measured in cubic yards measured in cubic yards	0	0	0	0
Potential impacts to fish and aquatic habitat are the same for all alternatives				

4.7.1.2.1. Alternative A (No Action)

Effects from Leasable Minerals

No lands within the White Mountains Subunit are open to leasing of either fluid minerals (oil and gas) or solid minerals (coal). There are no existing mineral leases. Under this alternative, impacts to fisheries and aquatic resources would be non-existent.

Effects from Locatable Minerals

The White Mountains Subunit is withdrawn from new locatable mineral entry. Mining is occurring on valid existing mining claims (3,500 acres), which are primarily located near Livengood. Beaver Creek, which contains the highest value fishery resources in the subunit, is closed to mineral entry within one-half mile of both banks under ANILCA. Since the majority of the subunit is closed to locatable mineral entry, especially areas containing high-value fish and aquatic habitat, impacts to fish and aquatic habitats are expected to be minimal under this alternative.

Effects from Recreation Management

This subunit receives a high level of recreational use and recreation management is focused on the White Mountains NRA and Beaver Creek WSR. There are set recreation objectives and varying levels of allowable recreational activities within the subunit, based on existing management units. Beaver and Nome Creek receive the greatest amount of fishing pressure due to good access and the high-value grayling fisheries found there. Recreation management on Nome and Beaver Creeks is virtually the same for all alternatives. Some off-trail motorized use is allowed under this alternative having the potential to impact fish and aquatic habitat. Impacts to fish and aquatic habitat are expected to be minimal under Alternative A.

Effects from Travel Management

The current OHV designation for the White Mountains NRA is "Limited" and allows cross-country travel with OHVs weighing 1,500 pounds and less during summer months on forty-four percent of the subunit. Areas closed to OHV travel during summer months, include the Beaver Creek WSR Corridor, RNAs, and the Primitive Management Unit, which comprise fifty-five percent of the subunit. Prohibiting summer use of OHVs within the Beaver Creek

WSR Corridor offers protection to the high-value fishery resources found there. Some trails are managed as non-motorized recreation trails and are generally closed to motorized use. Unmanaged trail proliferation would continue with no guidance for proper construction and placement of new trails. Given the assumption of increased OHV use during the life of the plan, the unauthorized and unmanaged proliferation of trails is also likely to increase under this alternative with a resulting increase in erosion and sediment impacts. Currently, there are no known impacts to fish and aquatic habitat from OHV use, but this could change with the trend of increasing use. Impacts to fish and aquatic habitat should be minimized with the protection of the OHV monitoring plan, which closes or restricts areas open to OHV use if resource damage such as erosion, sedimentation, and water pollution occurs.

Effects from Special Designations

There are three RNAs in this subunit: Limestone Jags (5,170 acres), Serpentine Slide (4,274 acres), and Mount Prindle (3,147 acres). These RNAs are closed to mineral location and leasing and no surface-disturbing activities are allowed, except permitted research projects. Fish and aquatic habitats benefit from those closures and restrictions because the habitat generally remains intact. Although fish and aquatic habitat resources are relatively low within these headwater RNAs, the protections provided ensure these headwater areas remain intact reducing potential impacts to fish and aquatic habitat lower in the drainage.

The Beaver Creek WSR contains high-value fishery resources, including Beaver Creek Chinook salmon which are currently on the BLM-Alaska Watch List. The river corridor is withdrawn from mineral leasing and location. Fish and aquatic habitats benefit in areas closed to mineral entry, because the habitat generally remains intact, reducing potential for future impacts on fish and aquatic habitat.

4.7.1.2.2. Alternative B

Effects from Leasable Minerals

Although Alternative B would open BLM split-estate to mineral leasing, the effects would essentially be the same as Alternative A due to the extremely limited amount of split-estate lands in the subunit (100 acres) and lack of potential for leasable minerals.

Effects from Locatable Minerals

Impacts to fish and aquatic habitats would be the same as Alternative A.

Effects from Recreation Management

In Alternatives B, C, and D the White Mountains SRMA is established. The size (just over one million acres) and boundaries of the SRMA remain the same for Alternatives B, C, and D, but the number and size of the different management zones within the SRMA varies between alternatives. Alternative B has the greatest number of acres in Primitive and Semi-Primitive management zones, which provide greater protection to fish and aquatic habitat than other zones. Alternative B would provide the most protection to fish and aquatic habitat. Impacts to fish and aquatic habitat are expected to be minimal under Alternative B.

Effects from Travel Management

Under Alternative B, the OHV designation would be Limited and summer use of OHVs weighing 1,000 pounds curb weight and less would be limited to designated trails on thirty-six percent of the subunit. Approximately sixty-one percent of the subunit would be closed to OHV travel in summer months, including the Beaver Creek WSR Corridor, RNAs, and Primitive, Semi-Primitive, and Backcountry RMZs. Proliferation of user made trails should be significantly reduced because OHVs would be restricted to designated trails. However, without adequate enforcement user made trails may continue and possibly increase as OHV use increases. Impacts are expected to be minimal. Alternative B would provide the greatest protection to fish and aquatic habitat when compared to Alternatives A, C, and D.

Effects from Special Designations

In addition to effects discussed under Alternative A of this subsection, Alternative B recommends 23 miles of Fossil Creek as suitable for designation in the National Wild and Scenic Rivers System. Fossil Creek is likely to support Arctic grayling and whitefish species. Fish and aquatic habitats benefit from Wild and Scenic River designations, because development is limited and the rivers are closed to new mineral entry and leasing. Alternative B would provide the greatest protection to fish and aquatic habitat when compared to Alternatives A, C, and D.

4.7.1.2.3. Alternative C

Effects from Leasable Minerals

The effects would be the same as Alternative B.

Effects from Locatable Minerals

Impacts to fish and aquatic habitats would be the same as Alternative A.

Effects from Recreation Management

Alternative C has more acres of land in Backcountry and Middlecountry RMZs and therefore less land in Semi-Primitive Zones, compared to Alternative B. Middlecountry Zones provide less protection to fish and aquatic habitat than do Primitive and Semi-Primitive Zones. This alternative allows for increased development of visitor facilities, landscape modifications, and group size. Alternative C has more potential to effect fish and aquatic habitat than Alternative B, but less than Alternatives A and D. However, effects from recreation would likely be minimal and easily mitigated with best management practices.

Effects from Travel Management

Similar to Alternative B, summer use of OHVs weighing 1,000 pounds curb weight and less would be limited to designated trails on forty-three percent of the subunit. Approximately fifty-four percent of the subunit would be closed to summer OHV travel, including the Beaver Creek WSR Corridor, RNAs, and Primitive, Semi-Primitive and Backcountry RMZ. However, this alternative allows off-trail use for the retrieval of big game and allows the use of larger UTVs on 27 miles of designated trails. Alternative C provides slightly less protection to fish and aquatic habitat than Alternative B, but more than Alternative A and D. Impacts to fish and aquatic habitat are expected to be minimal.

Effects from Special Designations

The effects would be the same as Alternative A.

4.7.1.2.4. Alternative D

Effects from Leasable Minerals

Alternative D would open 451,000 acres to leasable minerals. There is no potential for solid leasable and limited potential for oil and gas. Industry has shown no interest in leasing development in the White Mountains Subunit. If leasing occurred, further NEPA analysis would be required. Since there is limited potential, it is assumed that seismic surveys would not occur. Given those assumptions, impacts to fisheries and aquatic habitat would be minimal or non-existent.

Effects from Locatable Minerals

Impacts to fish and aquatic habitats would be the same as Alternative A.

Effects from Recreation Management

Alternative D has the greatest number of acres in Backcountry and Middlecountry RMZs and therefore the least number of acres in the more protective Primitive and Semi-Primitive Zones. This alternative allows for the greatest increase in development of visitor facilities, landscape modifications, and group size. Alternative D has more potential to effect fish and aquatic habitat than Alternatives B and C and would have similar effects as Alternative A. However, effects from recreation would likely be minimal and easily mitigated with best management practices.

Effects from Travel Management

Similar to Alternative A, summer cross-country use of OHVs weighing 1,000 pounds curb weight and less would be allowed on forty-six percent of the subunit. Approximately fifty percent of the subunit would be closed to summer OHV travel, including the Beaver Creek WSR Corridor, RNAs, and Semi-Primitive and Backcountry RMZs. Unmanaged trail proliferation would continue with no guidance for proper construction and placement of new trails. Given the assumption of increased OHV use during the life of the plan, the unauthorized and unmanaged proliferation of trails may also increase under this alternative with the potential for increased erosion and sediment impacts. This alternative would also allow the use of the larger UTVs on 112 miles of trail. OHVs would be restricted to designated trails in the Nome Creek Valley to protect visual and other resource damage in this high use area. This alternative has more potential to effect fish and aquatic habitat than Alternatives B and C and would have similar effects as Alternative A. Impacts to fish and aquatic habitat should be minimized with the protection of the OHV monitoring plan, which closes or restricts areas open to OHV use if resource damage such as erosion, sedimentation, and water pollution occurs.

Effects from Special Designations

Same as Alternative A.

4.7.1.3. Invasive Species White Mountains Subunit

Summary of Effects

Travel management, rights-of-way, and recreation would likely to have the greatest impacts on NIS in the subunit. Disturbances are the primary cause of impacts to NIS, particularly nonnative invasive plants.

Alternative B would result in the least impacts. This alternative provides the greatest opportunities to prevent the introduction and spread of NIS, particularly plant species, because the least amount of ground disturbing and travel activities would occur. Alternatives A and D would provide the lowest opportunities.

4.7.1.3.1. Effects Common to All Alternatives

In addition to effects discussed as common to all subunits in section 4.3.1.5.1, the following effects would occur in the White Mountains Subunit.

Effects from Forest and Woodland Products

Management decisions for forest and woodland products vary somewhat over the four alternatives in the White Mountains Subunit. Alternatives A and B would best protect against introduction and spread of NIS, as commercial use of timber and forest products are not allowed on ninety-eight percent of the subunit. Alternatives C and D only prohibit commercial use of timber in the Beaver Creek WSR Corridor (69,000 acres) and the RNAs (12,600 acres). However, restrictions on commercial uses of timber and forest products under Alternatives A and B, would have a limited beneficial effect for the following reasons. Timber within the subunit is not considered marketable due to the remote location of stands of suitable trees from access to milling and markets. Measures to mitigate the impacts of these actions on NIS and resources would be attached as stipulations to the authorizing documents for the use of timber and forest products. Monitoring and EDRR efforts conducted at sites disturbed by harvest of timber and forest products would mitigate impacts as well. Based on historic demand and use, lack of high-value timber, and limited access, minimal impacts to the introduction and spread of NIS would be expected from resource use of forest and woodland products under any alternative.

Effects from Leasable Minerals

All the BLM lands in the White Mountain Subunit are currently withdrawn from fluid and solid leasable minerals and there are no existing leases. Alternatives B and C would retain the closure to leasable minerals, except for opening 100 acres of split-estate lands. Alternative D would open forty-four percent (451,000 acres) in the Foothills Middlecountry RMZ to leasable minerals. The decisions to open some lands to leasing under Alternatives B, C, and D would have little effect due to the low development potential for leasable minerals within the subunit. Any exploration that might be proposed would require a permit and impacts would be mitigated through permit stipulations. Nominations for lease sales would be analyzed under a new NEPA document. No exploration or development is anticipated under any alternative due to the lack of development potential. No impacts to NIS would occur.

Effects from Locatable Minerals

Activity is limited to 4,000 acres of valid existing claims in the Livengood area many of which have been actively mined for decades. Land disturbance from mining typically creates suitable conditions for NIP species to become established. NIP are able to germinate in the marginal conditions, suppressing native vegetation from becoming established. Each operation must comply with BLM's reclamation standards, which minimize the impacts to NIP. Land disturbance

from mining typically creates suitable conditions for NIP species to become established because removal of over burden often results in a gravelly substrate with little or no fines. This substrate does not hold moisture and many NIP species can tolerate these arid conditions and become established. Monitoring and EDRR efforts would further reduce the potential for NIP to become established. The remaining lands in the subunit would be closed to locatable mineral entry under all alternatives and no new impacts to NIP would occur.

Effects from Recreation

Management of recreation areas through recreation opportunity spectrum (ROS) classes largely set the stage for the level of protection or development afforded an area. The size and location of RMZs, and therefore ROS settings, change with each alternative and are reflected in the decisions for travel management and related activities. Impacts to NIS are discussed under these other resource uses.

Effects from Travel Management

The White Mountains Travel Management Plan decisions vary widely across the four alternatives. The range of allowed uses includes non-motorized access only, size and weight limits of motorized vehicles, winter cross-country, designated trails, summer cross-country, permits for other uses and combinations of each. Roads and trails are prime habitat for NIP and vehicles (including boats and airplanes) are vectors for the introduction and spread of NIP. Limitations on OHV use, particularly limiting use to designated trails, would help prevent the introduction of NIP and aid EDRR efforts by concentrating use and reducing disturbance to native vegetation. Permitting use would provide opportunities to educate users on the threats to habitats from NIP and prevention measures they can take (use and site-specific mitigation).

Airboats, hovercraft and personal watercraft would be prohibited in the White Mountains SRMA under all of the action alternatives, which will significantly reduce disturbance to vegetation along streams and the potential for introduction and spread on NIP in the White Mountains subunit.

4.7.1.3.2. Alternative A (No Action)

Effects from Lands and Realty

Acquisition of inholdings within the White Mountains NRA would simplify and promote management of NIS, resulting in minimal but somewhat beneficial impacts to management of NIS resources.

Two transportation corridors are identified in the White Mountains NRA. All rights-of-way would be located within these corridors to the extent possible. Consolidation of rights-of-way within designated corridors would help prevent introduction and spread of NIP by reducing the overall disturbance. Monitoring for NIP and EDRR efforts would be aided by concentration of rights-of-way. However, rights-of-ways have not been applied for, outside of those for the BLM, for any specific uses or access and are not likely to occur over the life of the plan under any alternative. BLM proposed trails, or any other rights-of-way application, would be analyzed and measures to mitigate impacts would be attached to authorizing permits.

Effects from Salable Minerals

Disposal of salable minerals is allowed on all BLM lands in the subunit and authorized at the project level. Impacts to NIP are minimized through permit stipulations.

Material sites are commonly infested with NIP species. Moving materials from contaminated sites results in introduction of NIP at the project site, which would likely be in or adjacent to the BLM lands in the White Mountains Subunit.

Existing material sites are located near the highways, roads or other developments, and close to the site of ultimate use. Demand for gravel and other salable materials in the subunit is predicted to yield additional authorizations over the life of the plan. Development of future sites would likely be concentrated near projects, highways, and roads and be used locally. Although effects would likely be limited, site-specific measures to reduce impacts to NIP introduction and spread would be attached to authorizations. Monitoring and EDRR efforts by the BLM and operators/permittees would further reduce the potential for NIP to become established.

Effects from Travel Management

Under Alternative A, ninety-nine percent of the BLM lands in the subunit are open to winter use of OHV 1,500 pounds GVWR and less without a permit (Map 44). The Primitive Management Unit (494,000 acres) and Beaver Creek WSR Corridor (69,000 acres) are closed to summer motorized use. In the Semi-Primitive Motorized Management Unit (428,000 acres) cross-country travel with vehicles of 1,500 pounds and less GVWR is allowed. However, a permit is required for the use of OHVs of greater than 1,500 pounds GVWR off a valid right-of-way. The three RNAs are closed to motorized use. These limitations on OHV use, particularly not allowing summer use of OHVs, would help prevent the introduction and spread of NIP into some areas. However, Alternative A would have a high potential for the introduction and spread of NIP due to the allowance of cross-country summer travel on forty-four percent of the area.

4.7.1.3.3. Alternative B

Effects from Lands and Realty

Impacts from land tenure decisions would be the same as Alternative A.

One transportation corridor would be retained in Alternative B. The White Mountains ACEC, the three RNAs, and the Beaver Creek WSR Corridor would be right-of-way avoidance areas. No adverse impacts to NIS are expected from these decisions. As discussed under Alternative A, consolidating rights-of-way within designated corridors would help prevent introduction and spread of NIP by reducing the overall disturbance and travel throughout the subunit. Monitoring for NIP and EDRR efforts would be aided by concentrating transportation uses into a corridor. These beneficial effects would likely be minimal as few rights-of-way are anticipated, other than trails established by the BLM.

Effects from Salable Minerals

Approximately thirty-six percent of lands within the subunit would be open to salable minerals and proposed sales would be authorized at the project level. Demand for gravel and other salable materials is predicted to yield additional authorizations over the life of the plan. Development of future sites, similar to existing sites, would likely be concentrated near projects, highways, and roads and be for use locally. Although fewer acres would be open to salable minerals under

Alternative B than under Alternative A, demand is not expected to vary by alternative and effects would essentially be the same as Alternative A.

Effects from Travel Management

Under Alternative B, 4,000 acres would be undesignated recreation area. Cross-country winter and summer use of OHVs 1,500 pounds curb weight and less would be allowed. Use of larger vehicles would be allowed on existing roads.

Non-motorized transportation, including horses and bicycles, would be allowed in all areas. The RNAs (12,600 acres) would be closed to all motorized OHV use. Semi-Primitive and Backcountry RMZs (623,000 acres) would be open to winter use of snowmobiles 1,000 curb weight and less. Within the Middlecountry RMZ (329,000 acres) and Frontcountry RMZ (39,000 acres), cross-country use of snowmobiles would be allowed. Travel by OHVs 50" and less and 1,000 curb weight and less would be limited to designated trails. Use of aircraft would generally be unrestricted (with provisions) in all but the Primitive RMZ. Use of motorized vehicles exceeding the limitations set for each RMZ would require a permit.

This alternative offers the best protection against the introduction and spread of NIP. Using designated trails in the summer reduces disturbance from user established trails, which protects against new pathways for pioneering NIP to become established. EDRR would be enhanced by concentration of OHV on trails. Where permits are required, stipulations to reduce the threat of introductions would mitigate the potential for introduction and spread. Other active management, including outreach and education at boat launches, trail heads and targeting float plane pilots, could mitigate impacts. This alternative also has the largest acreage (sixty-one percent) closed to summer OHV use.

4.7.1.3.4. Alternative C

Effects from Lands and Realty

Impacts from land tenure decisions would be the same as Alternative A.

Alternative C differs from B in that no transportation corridors and no right-of-way avoidance areas would be identified. Impacts to NIS, particularly plants, would potentially increase because rights-of-way could be developed within areas more vulnerable to disturbance, enhancing the potential for NIP to establish and spread. Rights-of-way may cross streams, and many NIP seeds are readily dispersed by water. Infestations of species such as white sweetclover (*Melilotus officinalis*, formerly *M. alba*) have been documented on sand bars along the Nenana River, spreading from source populations far upstream (Conn et al., 2008). The increased potential for impacts would likely be minimal due to the lack of rights-of-way anticipated and the fact that even if transportation corridors and right-of-way avoidance areas existed, rights-of-way could still be approved outside of these areas.

Effects from Salable Minerals

All but the Beaver Creek WSR Corridor would be open to salable minerals under Alternative C. Although ninety-three percent of the area would be open, impacts would be essentially the same as Alternatives A and B, since demand would not vary by alternative.

Effects from Travel Management

Alternative C differs from Alternative B in the location and size of the RMZs and that off-route travel for game retrieval is allowed in the undesignated recreation areas and all but Semi-Primitive and Backcountry RMZs. Approximately ninety-seven percent of the area is in designations that would allow cross-country winter use of snowmobiles 1,000 curb weight and less. Summer use of OHV 1,000 pounds curb weight and less is limited to designated trails, except for retrieval of game, on forty-three percent of the area.

The potential for introduction and spread of NIP species would increase substantially in this alternative compared to Alternative B. Off-route travel for game retrieval would be concentrated during seasons when many of the weeds of concern will be in seed. Many of the OHV will come from outside the area, increasing the likelihood of introducing new NIP species to the area. EDRR, outreach and education, and larger scale control efforts would be used to try to mitigate impacts.

4.7.1.3.5. Alternative D

Effects from Lands and Realty

Impacts from land tenure decisions would be the same as Alternative A. Impacts from land use authorizations would be the same as Alternative C.

Effects from Salable Minerals

The entire subunit would be open to salable minerals under Alternative D. Impacts would essentially be the same as Alternatives A, B, and C since demand would not vary by alternative.

Effects from Travel Management

Alternative D differs from Alternative C in the location and size of the RMZs and that cross-country summer use of OHVs (1,000 pounds curb weight and less) would be allowed on 464,000 acres or forty-five percent of the area (undesignated recreation area, Middlecountry and Frontcountry RMZs). Alternative D would have high potential for the introduction and spread of NIP. Cross-country summer travel would occur across the seed maturation period of all weeds of concern. Many of the OHV will come from outside the area, increasing the likelihood of introducing species that do not already occur in the area. EDRR, outreach and education, and larger scale control efforts would be used to mitigate impacts. Impacts would be similar to Alternative A.

4.7.1.3.6. Cumulative Effects

Cumulative impacts would be similar among the alternatives, but will vary in the extent of effect. Alternative B would contribute least to cumulative effects. Cumulative effects would be greatest under Alternatives A and D, which have fewest restrictions on OHV use, for example. Alternative C would provide a balance of management of NIS while providing for multiple uses of BLM lands.

Demand for recreational use in and around the White Mountains NRA is anticipated to increase over the life of the plan as populations in the state increase and as technological advancements in recreation equipment occur. Placer mining is occurring on valid federal mining claims in the Livengood area and state mining claims in the White Mountains Subunit. There would be no increase in federal lands available for mining under any alternative. In addition to potential realty actions and OHV use occurring on state and private lands, similar activities authorized under this plan would increase the potential for invasion and spread of NIS in the White Mountains Subunit.

4.7.1.4. Soil and Water Resources White Mountains Subunit

Summary of Effects

Since much of the White Mountains Subunit is underlain by permafrost even relatively minor surface disturbances can lead to long-term adverse impacts to soil and water resources. A variety of resources, resource uses, or programs outlined in the action alternatives protect soil and water resources including proposed riparian conservation areas to protect fish and aquatic species habitat, lands managed for wilderness character, and weight restrictions for OHVs. Conversely, surface disturbance associated with lands and realty, recreation development, and increased OHV travel could potentially result in varied adverse impacts to soil and water resources.

Adverse impacts to soil and water resources, based on expected area of disturbance, would be progressively greater by action Alternatives B, C, then D. Alternative D would likely result in the greatest disturbance to soil resources and adverse impacts to water quality. The impacts associated with Alternative A vary by program, but would generally be similar to Alternative C. Appropriate stipulations and ROPs for soil and water resources would be implemented to ensure that long-term impacts would be minimized or avoided under all alternatives.

4.7.1.4.1. Effects Common to All Alternatives

Effects from Locatable Minerals

The White Mountains Subunit is currently withdrawn from locatable mineral entry and would remain closed to new locatable mineral entry under all alternatives. Approximately 4,000 acres of valid existing claims, outside the White Mountains NRA, predate the withdrawals. Mining is occurring on some of these claims.

Impacts to soil and water resources could occur on existing claims near Livengood in all alternatives. Mine operations utilizing heavy equipment have the potential to adversely impact soil resources and water quality through erosion, unintended discharge of sediment laden water, and subsequent increased downstream turbidity. Depending on the methods used and size of operation, mining operations could impact the natural water quality and flow characteristics of selected river segments. Disturbance to soil and water resources from mining operations would be reduced through ROPs and site-specific analysis of subsequent authorizations.

4.7.1.4.2. Alternative A (No Action)

Effects of Land and Realty Actions

There are two transportation corridors established in the White Mountains NRA. Construction of or continued use of existing trails and roads that occur within these corridors have the potential to adversely impact soil and water resources through surface disturbance activities. Outside of the NRA, there are no designated transportation corridors and rights-of-way are considered in all areas. In the White Mountains Subunit, this is primarily limited to federal mining claims near Livengood.

Effects of Recreation

Recreation management is focused on the White Mountains NRA and Beaver Creek WSR Corridor, which are essentially managed as an SRMA with recreation objectives and varying

levels of allowable recreational activities. The construction of infrastructure to support these activities would be ground disturbing, and thus could potentially affect soil and water resources. Nonetheless, past impacts to soil and water resources have been low and future impacts are expected to be minimal under Alternative A.

Effects of Travel Management

Disturbance of soil and water resources is expected to increase because travel visitation in the subunit is expected to increase by ten to fifteen percent over the life of the plan. Activities such as construction of new trails have the potential to adversely impact resources. Also, some off-trail motorized use is allowed having the potential to impact soil resources and water quality. However, past impacts to soil and water resources have been low and future impacts are expected to be minimal under Alternative A.

4.7.1.4.3. Alternative B

Alternative B emphasizes active measures to protect and enhance resource values. It is anticipated that the greatest level of resource protection would occur under this alternative, and consequently, the lowest level of soil and water resource disturbance.

Effects of Land and Realty Actions

Under Alternative B one transportation corridor would concentrate the building of access roads and potentially provide a location for other rights-of-way such as pipelines, transmission lines and associated facilities.

Designation of Serpentine Slide, Limestone Jags, and Mount Prindle RNAs, the White Mountains ACEC, and Beaver Creek WSR Corridor as right-of-way avoidance areas would protect soil and water resources. Activities such as removal of vegetation or construction of facilities associated with rights-of-way would not be allowed.

Effects of Recreation

Under Alternative B, 1,017,000 acres in the White Mountains would be established as a SRMA. Acreage for SRMA would be the same for Alternatives C, and D but the number and area of the various Recreation Management Zones (RMZs) within the SRMA would differ between alternatives (Maps 48, 49 and 50). Compared to other Alternatives, Alternative B would allocate the greatest number of acres to Semi-Primitive (483,000) RMZs. Semi-Primitive RMZs provide protection to soil and water resources because of OHV travel restrictions. Impacts to soil and water resources from recreation management actions under Alternative B are expected to be minimal.

Effects of Travel Management

The Beaver Creek WSR Corridor would remain closed to summer OHV use. The use of OHVs with a curb weight of 1,000 pounds or less would be allowed on designated trails during summer. Cross-country use of snowmobiles could occur in most areas (Maps 48, 49 and 50).

Alternatives B and C would provide the greatest protection to soil and water resources when compared to Alternatives A and D because they would designate the same number of acres (12,600) to Primitive RMZ and RNA, areas are closed to all OHV use, and 13,400 acres in the White Mountains Spine as Primitive RMZ with Limited OHV designation; winter use of snowmobiles allowed. Continued trail maintenance, seasonal travel restrictions, and OHV weight

restrictions would reduce the amount of surface disturbance potentially affecting soil and water resources.

4.7.1.4.4. Alternative C

Alternative C emphasizes a moderate level of protection, use, and enhancement of resources and services that would provide a balance between development and protection of resources in the subunit. Anticipated resource development levels, as well as impacts to soil and water resources, would be greater than in Alternative B but less than in Alternative D. In some areas, OHV travel would be excluded to protect sensitive resources.

Effects of Land and Realty Actions

Under Alternative C, no transportation corridors would be identified and no right-of-way avoidance areas would be designated. This would allow for the construction of rights-of-way throughout the subunit, 1,020,000 acres, and could result in disturbance to soil and water resources. However, because of limited resource development opportunities, few rights-of-ways are anticipated within the White Mountains NRA during the life of the plan.

Effects of Recreation

Alternative C would allocate more land to Backcountry (382,000 acres) and Middlecountry (398,000 acres) RMZs and less land in Semi-Primitive (171,000 acres) RMZs compared to Alternative B. Middlecountry Zones provide less protection to soil and water resources than the more restrictive Primitive and Semi-Primitive RMZs. Alternative C allows for increased development of visitor facilities, landscape modifications, and group size. Hence, Alternative C provides less protection of soil and water resources compared to Alternative B, but more protection than Alternatives A and D.

Effects of Travel Management

Alternative C and B would provide the greatest protection to soil and water resources when compared to Alternatives A and D because Alternatives C and B have greater restrictions on OHV use. Alternatives B and C would designate the same number of acres (12,600) to Primitive RMZ and RNA, areas are closed to all OHV use, and 13,400 acres in the White Mountains Spine as Primitive RMZ with Limited OHV designation; winter use of snowmobiles allowed. Proliferation of user made trails should be minimal, because OHVs are restricted to designated trails. Trail maintenance, seasonal travel restrictions and OHV weight and width restrictions would reduce the amount of surface disturbance potentially affecting soil and water resources.

4.7.1.4.5. Alternative D

Effects of Land and Realty Actions

Under Alternative D, the Perhaps Creek portion of PLO 4167 would be revoked. This revocation would allow 200 acres to be transferred out of BLM management and open for development and any associated surface-disturbing activities.

Similar to Alternative C, no transportation corridors or right-of-way avoidance areas would be identified, resulting in potential disturbance to soil and water resources.

Effects of Recreation

Alternative D has the greatest number of acres allocated to Backcountry (445,000) and Middlecountry (452,000) RMZs and therefore the least number of acres in the more protective Primitive and Semi-Primitive RMZs. This alternative allows for the greatest increase in development of visitor facilities, landscape modifications, and group size. Thus, Alternative D has greater potential to impact soil and water resources than Alternatives B and C and would likely have similar effects to Alternative A.

Effects of Travel Management

Alternative D greatly increases the amount of area where OHVs can travel cross-country during the summer and expands the type of vehicles allowed compared to Alternatives B and C. Hence, Alternative D has more potential to adversely impact soil and water resources through soil erosion and stream siltation than Alternatives B and C and would likely have effects similar to Alternative A. Measures to minimize disturbance of soil resources and protect water quality would be developed with site-specific stipulations and ROPs during NEPA analysis of travel management actions.

4.7.1.5. Visual Resources White Mountains Subunit

Summary of Effects

VRM Classes outline the level of change that could occur within that class. Identifying an area as a specific management class does not guarantee that change will take place. The discussion below identifies the number of acres that may retain or lose visual quality due to management in a specific VRM Class; however, the potential for every acre to lose visual quality due to management in a specific VRM Class is extremely low. The analysis logically assumes that areas designated as VRM Class III and IV would permit more surface-disturbing impacts and potentially have greater adverse impacts on visual resources and scenic quality than those areas designated as VRM Class I and II.

In addition to those impacts discussed under section 4.3.1.9 Impacts Common to all Subunits, the following impacts may occur in the White Mountains Subunit. For the visual resource inventory see Appendix D, *Visual Resource Inventory*.

Alternatives — VRM Management Class Designations		VISUAL RESOURCES INVENTORY CLASS DESIGNATION ^a			
		VRI Class I		VRI Class II	
		71,000	7%	950,000	93%
Alternative A	Acres	Acres	%	Acres	%
VRM I	69,000	69,000	7	227	<1
VRM II	506,000	1,000	<1	505,000	50
VRM III	428,000	57	<1	428,000	42
VRM IV					
Total^b	1,003,000	71,000	7	933,000	92
Alternative B	Acres	Acres	%	Acres	%
VRM I	96,000	70,000	7	25,000	3
VRM II	554,000			554,000	54
VRM III	367,000			367,000	36
VRM IV	4,000			4,000	<1
Total	1,020,000	70,000	7	950,000	93
Alternative C	Acres	Acres	%	Acres	%

Alternatives — VRM Management Class Designations		VISUAL RESOURCES INVENTORY CLASS DESIGNATION ^a			
		VRI Class I		VRI Class II	
		71,000	7%	950,000	93%
VRM I	96,000	70,000	7	25,000	3
VRM II	217,000			217,000	21
VRM III	268,000			267,000	26
VRM IV	440,000			440,000	43
Total	1,020,000	70,000	7	950,000	93
Alternative D	Acres	Acres	%	Acres	%
VRM I	82,000	70,000	7	12000	1
VRM II				123,000	12
VRM III	445,000			321,000	31
VRM IV	494,000			494,000	48
Total	1,020,000	70,000	7	950,000	93

^aNo lands in the White Mountains classed as VRI Class III or IV in the inventory.

^bIn Alternative A, only the White Mountains NRA and Beaver Creek WSR Corridor have assigned VRM Classes.

4.7.1.5.1. Effects Common to All Alternatives

Effects from Cave and Karst

The cave and karst resources are located within the Limestone Jags RNA and are managed under a Primitive recreation opportunity spectrum classification to preserve scientific integrity. The area is closed to OHV use, mineral entry, and mineral leasing. These management actions help protect the visual resources by maintaining the area in a near natural landscape.

Effects from Cultural and Paleontological Resources

Use of four public use areas (approximately six acres) will continue to impact visual resources from changes in vegetation through the creation of trails and facilities associated with increased use. Changes to line, form, color and texture will result in greater contrast between exposed soils and adjacent vegetation. Temporary camps and human-made facilities will introduce color and straight lines into an already disturbed landscape. Colors from temporary camps will be the greatest impact, but would be short-term, generally lasting only a few nights. Impacts from scientific use are described in section 4.3.1.9 Impacts Common to All Subunits.

Effects from Locatable Minerals

The entire subunit is closed to locatable minerals and this would remain the case under all alternatives. Visual resources would only be impacted by mining on 4,000 acres of valid existing claims in the Livengood area. These impacts would be present in varying degree depending on the number and size of active mining operations and the degree of reclamation on existing disturbed areas. But, would not vary by alternative.

One large-scale placer mine operation is anticipated near Livengood. The operation would have a disturbed annual footprint of 16 acres over the life of the mine which is anticipated to be between 10 to 20 years for a total of 60 to 80 acres of disturbance. Additionally, up to three small-scale placer mine operations are anticipated. Each operation would have a disturbed annual footprint of 4.4 acres over the life of the mine which is anticipated to be between 10 to 20 years for a total of 20 to 30 acres of disturbance. Impacts from all three operations would impact between 60 to 90

acres over the life of this plan. Impacts from mining operations are described in section 4.3.1.9 Impacts Common to All Subunits.

The preference of winter cross-country moves associated with mining activities helps protect visual resources by reducing the amount of disturbance to soils and vegetation when the ground is frozen and vegetation is at least partly covered by snow. Some changes to line, form, color and texture still occurs through clearing the route of large woody vegetation in a relatively straight line on an otherwise irregular, multi-hued landscape.

Effects from Travel Management

Trail construction, for non-motorized or motorized use, causes changes in color, line, and texture on the landscape. The destruction of vegetation and the hardening of the travel surface create a contrast between the adjacent greens of natural vegetation and the browns and grays of the soils or travel surface materials. A contrast in line occurs when the irregular characteristics of vegetation is altered by a more regular line in the form of a constructed trail. Texture characteristics change from the natural course or rough textures of diverse vegetation to the smooth uniform texture of a developed trail, trail hardening techniques, or soil surface areas. Most trails would attract attention of the casual observer if viewed from a higher observation point and if the trails were located within the Foreground-Middleground and Background zones. Trails that are properly designed and viewed from ground level, however, would not generally attract the attention of a casual observer, except from trailhead observation points.

4.7.1.5.2. Alternative A (No Action)

In addition to impacts discussed as common to all subunits in section 4.3.1.9, the following impacts would occur in the White Mountains Subunit under Alternative A.

Effects from Visual Resources

Under Alternative A, of VRI Class I acres (seven percent), one-hundred percent would continue to be managed as VRM Class I resulting in preservation of the existing visual character of those lands. These lands, the Beaver Creek WSR Corridor, have an A rating for scenic quality, high sensitivity and occur in the foreground-middle ground zone.

Additionally, of VRI Class II lands (ninety-three percent), less than one percent would be managed as Class I resulting in preservation of the existing visual character of the lands associated with the Beaver Creek WSR Corridor. Approximately fifty-three percent of VRI Class II land would be managed as VRM Class II allowing a low level of change, while forty-five percent would be managed as VRM Class III, potentially resulting in only partially retention of landscape characteristics. These lands have an A rating for scenic quality, a high sensitivity and occur in both the Foreground-Middleground and Background zones.

No lands classed as VRI Class III or VRI IV during the inventory and no lands would be managed as VRM Class III or VRM Class IV under any alternative.

Using design fundamentals of proper siting and location, reducing unnecessary disturbance and by repeating the landscape elements of form, line, color and texture for all surface-disturbing activities can contribute significantly in reducing impacts to visual resources, regardless of VRM Class.

Effects from Water Resources

Management activities such as closing watersheds to OHV use would improve visual resources over long-term as trails are naturally revegetated, covering exposed soil and cleared vegetation regrows. The scope of effects would depend on the size of the closure.

The Water Resources and Riparian Reclamation project along Nome Creek will enhance visual resources by reclaiming past mining activities and returning the stream to one proper functioning channel, on approximately seven miles of the creek. Reducing materials piles and restoring the floodplain will return the site to a more natural landscape in line and form. Natural revegetation will return a more natural line, form, color and texture to the landscape.

Effects from Wildlife

Management activities for wildlife and wildlife habitat generally include restrictions on other resource use such as closing areas to mining, seasonal closures or the use of prescribed fire. Closing areas to certain surface-disturbing activities would improve visual resources by not allowing those activities. Seasonal closures protect visual resources for the duration of the closures. Impacts from prescribed fire would last the longest and are described in section 4.3.1.9. The size and scope would depend on the size of the closures and prescribed fire area.

Effects from Forest and Woodland Products

No commercial timber harvest is permitted under Alternative A, which would protect visual resources on 1,020,000 acres. Personal use of timber is allowed throughout the subunit. Management restrictions may include winter cutting and movement, maintaining a set distance from waterways, and lopping and scattering slash. These management restrictions would help reduce impacts to visual resources. The size and scope of impacts would depend on the size of the area and the harvest techniques used.

Effects from Land and Realty

The two transportation corridors (27,000 acres) would concentrate the building of access roads and possibly provide a location for other ROWs such as pipelines, transmission lines and associated facilities. This consolidation of ROW facilities would help protect visual resources by limiting the locations of surface disturbance and facilities development. If alternative ROWs are necessary, existing trails or travel routes would be used whenever possible. Using existing trails would reduce impacts to visual resources by using already disturbed areas where possible.

Retaining all lands within the White Mountains NRA under BLM management will help protect visual resources by limiting non-BLM actions to current inholdings. Retaining other important lands for recreation purposes helps protect visual resources by evaluating surface-disturbing activities and development on these lands. Retention applies to approximately 1,017,000 acres.

There are three withdrawals under PLO 4176 totaling 505 acres for BLM development as recreation sites. These withdrawals would be maintained, protecting visual resources by keeping these lands under BLM's management.

Effects from Leasable Minerals

The entire subunit, 1,020,000 acres, is closed to both fluid and solid leasable minerals. Visual resources will not be impacted by exploration or development of leasable minerals.

Effects from Salable Minerals

The entire subunit (1,020,000 acres) is open to salable minerals. Impacts from the mining of salable minerals are described under section 4.3.1.9. Visual resources would be protected on a project-specific basis through the use of management class objectives and the visual contrast rating process. While the subunit would be open to salable minerals it is anticipated that demand for material will generally be met from production on state lands and only 100 acres along roads would be mined within this subunit. Mining activities for salable minerals would generally occur along roads due to transportation requirements.

Effects from Recreation

Development within the Beaver Creek WSR Corridor and adjacent viewshed of the river has been minimized. Six winter trails cross Beaver Creek and were designed to retain the existing character of the landscape and to meet VRM Class II objectives. Some human-made features, such as trapping cabins and inholdings are located within the corridor. Many of these facilities are made using natural appearing materials and blend with the surrounding landscape in color. These management activities help protect the visual resources in the corridor (69,000 acres).

The Primitive Management Unit is managed to protect the wild and natural character of the area. Facilities such as motorized trails, non-motorized trails, and public use cabins were constructed of natural appearing materials and blend with the surrounding landscape. These management activities help protect the visual resources on 494,000 acres.

The highlands, consisting of the high ridge complex from Cache Mountain to Lime Peak and Mount Prindle, plus the White Mountains backbone and Victoria Mountain, are managed to protect remote primitive values, including outstanding scenic vistas of high mountain terrain, pristine areas with virtually no evidence of human-made improvements. These management activities help protect the visual resources on 494,000 acres.

The Semi-Primitive Motorized Management Unit has a number of human-made facilities, such as trails, roads, trail-heads, public use cabins, shelters, campgrounds with related facilities and an administrative site. These facilities were constructed as sustainable and to blend with the surrounding landscape characteristics, thus protecting visual resources on 428,000 acres.

Effects from Travel Management

Research Natural Areas are closed to OHV use. This helps protect visual resources by preventing surface disturbance to vegetation and soils from the use of motorized vehicles, on 12,600 acres.

The Beaver Creek WSR Corridor management allows motorized use of OHV weighing 1,500 pounds GVWR and less without permit for winter travel. This helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape, even with cross-country travel allowed, because of the frozen soils and snow cover on lower growing vegetation. These management activities help protect the visual resources on 69,000 acres. The Windy Creek and Fossil Creek drainages are closed to OHV use from April 15 to August 31. This closure helps protect visual resources by closing these drainages within the river corridor to travel from April 15 until the snow melts along approximately 27 miles.

The Primitive Management Unit (Map 44) allows for motorized use of OHV weighing 1,500 pounds GVWR and less without permit for winter travel. This helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of

the natural landscape, even with cross-country travel allowed, because of the frozen soils and snow cover on lower growing vegetation. These management activities help protect the visual resources on 494,000 acres.

The Semi-Primitive Motorized Unit allows for unrestricted travel by OHVs weighing 1,500 pounds GVWR and less year round. This helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape, even with cross-country travel allowed, because of the frozen soils and snow cover on lower growing vegetation. These management activities help protect the visual resources on 428,000 acres. It also allows for use of vehicles greater than 1,500 pounds GVWR on US Creek Road, along valid ROWs such as roads within the Nome Creek Valley, and approximately 11 miles of tailings along Nome Creek. These areas are hardened and show little change from the existing modified landscape. These management actions impact visual resources on 428,000 acres.

The use of motorized vehicles greater than 1,500 pounds GVWR within the White Mountains NRA and Beaver Creek is allowed by permit. The impacts from this travel would vary depending on the size of vehicle, season of travel, and the number of passes made. Impacts would be similar to those described for cross-country travel under section 4.3.1.9 Impacts Common to All Subunits.

Travel on lands outside the White Mountains NRA and Beaver Creek is unrestricted and may impact visual resources on 4,000 acres by disturbing primarily vegetation by repeated passes and by clearing travel routes.

Effects from Special Designations

Under Alternative A, three areas are designated as RNAs and no surface-disturbing activities are allowed except by permit in association with research projects. The RNAs are closed to OHV, camping, and mineral location and leasing. These management activities will help protect visual resources by limiting surface-disturbing activities in association with permits issued for research projects on 12,600 acres.

The Beaver Creek WSR Corridor is managed to preserve the river and its immediate environment in its natural, primitive condition, in accordance with the Wild and Scenic Rivers Act (P.L. 90542). The designated corridor (69,000 acres) is managed as VRM Class I. No additional rivers are recommended suitable for designation.

4.7.1.5.3. Alternative B

Additional impacts under Alternative B, beyond those discussed as common to all subunits under section 4.3.1.9 are discussed below.

Effects from Fish and Aquatic Species

There are 15 Riparian Conservation Areas (RCAs) identified for accelerated rehabilitation of habitats which include active revegetation and streambank stabilization techniques on 488,000 acres. These activities would have a positive impact to areas with surface disturbance in returning the disturbance to a more natural looking landscape faster than natural revegetation.

Of VRI Class I lands (67,000 acres) one-hundred percent would be managed under Class I management retaining the natural appearance of the landscape. Of VRI Class II lands, two percent or 6,000 acres would be managed as Class I while sixty-two percent or 263,000 acres

would be managed as Class II lands and thirty-six percent (152,000 acres) would be managed as Class III lands allowing some change to the natural landscape. No lands were identified as VRI Class III or IV.

Effects from Visual Resources

Under Alternative B, of VRI Class I acres (seven percent), one-hundred percent (70,000 acres) would continue to be managed as VRM Class I resulting in preservation of the existing visual character of those lands. These lands, the Beaver Creek WSR, have an A rating for scenic quality, high sensitivity and occur in the foreground-middle ground zone.

Additionally, of VRI Class II lands (ninety-three percent or 950,000 acres), approximately three percent (25,000 acres) would be managed as VRM Class I resulting in preservation of the existing visual character of these lands associated with the Beaver Creek WSR Corridor. Approximately fifty-eight percent (554,000 acres) of VRI Class II land would be managed as VRM Class II allowing a low level of change, while thirty-nine percent (367,000 acres) would be managed as VRM Class III, potentially resulting in only partial retention of landscape characteristics. Less than one percent (4,000 acres) would be managed as Class IV lands potentially resulting in a high level of change to the landscape characteristics. These lands have an A rating for scenic quality, a high sensitivity and occur in both the Foreground-Middleground and Background zones.

Using design fundamentals of proper siting and location, reducing unnecessary disturbance and by repeating the landscape elements of form, line, color and texture for all surface-disturbing activities can contribute significantly in reducing impacts to visual resources, regardless of VRM Class.

Effects from Wilderness Characteristics

Visual characteristics are related to the criteria used to determine the presence of wilderness characteristics which includes naturalness. Management decisions to preserve wilderness characteristics help to preserve the visual resources of the area by limiting surface-disturbing activities and maintaining natural vegetation and landform. Under Alternative B, wilderness characteristics would be maintained on 509,000 acres (fifty percent), limiting activities that impact the appearance of naturalness.

Of VRI Class I lands with wilderness characteristics (70,000 acres) one-hundred percent would be managed under Class I retaining the natural appearance of the landscape. Of VRI Class II lands with wilderness characteristics, six percent or 25,000 acres would be managed as Class I while ninety-four percent or 414,000 acres would be managed as Class II lands. No lands with wilderness characteristics were identified as VRI Class III or IV lands.

Effects from Wildlife

In addition to the effects discussed under Alternative A, the following effects would occur under Alternative B. If OHV travel impacts wintering caribou by reducing caribou use of an area, then use restrictions or closures may occur. These actions would improve visual resources by restricting or eliminating damage to vegetation and clearing of winter trails. Changes in vegetation, and clearing winter trails and travel routes from OHV use impact visual resources by primarily changing the line, color and texture of the natural landscape.

Effects from Forest and Woodland Products

Personal use of timber, timber salvage sales, commercial timber sales, and commercial use of forest products would not be allowed within the White Mountains SRMA (inclusive of Beaver Creek WSR). Temporary camps and various impacts from different harvest techniques would not impact 1,017,000 acres. These management actions would help protect visual resources.

The rest of the subunit would be open to these uses, potentially impacting visual resources on 4,000 acres. The size and scope of impacts would depend on the size of the area and harvest techniques used.

Effects from Land and Realty

Under Alternative B, the retention of one transportation corridor (7,000 acres) would continue to concentrate the building of access roads and possibly provide a location for other rights-of-way. This consolidation of rights-of-way facilities would help protect visual resources by limiting the locations of surface disturbance and facilities development associated with these activities.

All of the lands within the transportation corridor were identified as VRI Class II lands (7,000 acres) one-hundred percent would be managed as Class III lands allowing some change to the natural landscape.

The designation of Serpentine Slide, Limestone Jags and Mount Prindle RNAs, the White Mountains ACEC, and Beaver Creek WSR Corridor as a right-of-way avoidance areas would protect visual resources by not allowing clearance of vegetation and construction of structures associated with different kinds of rights-of-ways. A natural landscape in line, form, color and texture would be maintained on 95,000 acres.

Recreation withdrawals under PLO 4176 would be maintained, protecting visual resources by keeping these lands under BLM's management.

Effects from Leasable Minerals

Under Alternative B, approximately 100 acres of split-estate lands would be open to fluid mineral leasing subject to major constraints. The remainder of the subunit would be closed to both solid and fluid leasable minerals. These actions would protect visual resources.

Effects from Salable Minerals

Approximately 649,000 acres would be closed to salable minerals, including the three RNAs, the Primitive RMZ, the Beaver Creek WSR Corridor, the Highlands RMZ, and the Cache Mountain RMZ. Visual resources would not be impacted on these lands. Impacts to visual resources by production of salable mineral resources on the remaining 371,000 acres would depend on the scale of the action and the number of mineral sites. Changes to line, form, color and texture of the natural landscape would result from activities such as trenching, road building for access, vegetation clearing for exploration activities, and mineral extraction processes. Buildings and other facilities would impact primarily line, color and texture.

While thirty-six percent of the subunit is open to salable minerals under Alternative B, it is anticipated that only 100 acres would be material sites would be approved over the life of the plan. Mining activities for salable minerals would generally occur along roads due to transportation requirements. Impacts to visual resources by the development of salable minerals are described under section 4.3.1.9.

Effects from Recreation

Recreation Management Zones (RMZs) are managed for different physical settings which include remoteness, naturalness and visitor facilities. Of these, naturalness and visitor facilities impact visual resources by setting prescriptions for management, i.e., describing the amount of naturalness and how facilities will sit on the landscape. These prescriptions include a range from Primitive, Semi-Primitive, Backcountry, Middlecountry, Frontcountry, Rural and Urban, each with different levels of naturalness and descriptions of how facilities will sit on the landscape.

Of VRI Class I lands (70,000 acres) one-hundred percent would be retained under class I management. Of VRI Class II lands, three percent or 25,000 acres would be managed as Class I while fifty-eight percent or 55,000 acres would be managed as Class II lands and thirty-nine percent (37,000 acres) would be managed as Class III lands allowing some change to the natural landscape. No lands were identified as VRI Class III or IV.

Under Alternative B: the Beaver Creek WSR Corridor and the Primitive RMZ would have a VRM Class I (96,000 acres); the Semi-Primitive and Backcountry RMZs would have a VRM Class II (554,000 acres); the Middlecountry and Frontcountry RMZs would have a VRM Class III (368,000 acres); and all other lands would have a VRM Class IV (4,000 acres).

Effects from Travel Management

Travel management on other BLM lands outside the SRMA

Open cross-country travel on (4,000 acres) is restricted to winter use of snowmobiles weighing 1,000 pounds curb weight and less, and summer use of OHVs weighing 1,500 pounds curb weight and less. These restrictions may impact visual resources by disturbing vegetation by repeated passes and by clearing of travel routes. Vehicles weighing less than 10,000 pounds curb weight would be allowed on existing roads. This would protect visual resources by restricting this type of use to already hardened areas. All other vehicle use could be allowed under permit. The impacts larger vehicles would vary depending on the size of vehicle, season of travel, and the number of passes made but would be similar to impacts described for open cross-country travel, except on a larger scale. Impacts to visual resources by open cross-country travel are described in section 4.3.1.9.

Travel Management within the SRMA

Within all zones, restrictions or closures associated with travel may occur to protect resources. These actions would improve visual resources by restricting or eliminating damaged to vegetation and clearing of trails.

Research Natural Areas are closed to OHV use. This helps protect visual resources by preventing surface disturbance to vegetation and soils from the use of motorized vehicles on 12,600 acres. The remainder of the Primitive Zone (13,400 acres) would be closed to summer OHV use, but open to the winter use of snowmobiles.

The **Semi-Primitive Zones** (483,000 acres), which include Beaver Creek WSR Corridor and the White Mountains Highlands, allows cross-country motorized use of OHV weighing 1,000 pounds curb weight and less without permit for winter travel. The season of travel and weight restriction helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape, even with cross-country travel allowed, because of the frozen soils and snow cover on lower growing vegetation.

The **Backcountry Zone** (140,000 acres) allows cross-country motorized use of OHV weighing 1,000 pounds curb weight and less without permit for winter travel. The season of travel and weight restriction helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape even with cross-country travel allowed because of the frozen soils and snow cover on lower growing vegetation. In addition, Windy Creek and Fossil Creek drainages are closed to OHV use from April 15 to August 31. As in Alternative A, this closure helps protect visual resources by closing these drainages to travel from April 15 until the snow melts along approximately 27 miles.

In both the Semi-Primitive and Backcountry zones, the summer use of OHV weighing 1,000 pounds curb weight and less and all use of motorized vehicles greater than 1,000 pounds curb weight may be allowed by permit. The impacts from vehicles would vary depending on the size of vehicle, season of travel, and the number of passes made. They would be similar to impacts described for cross-country travel except on a larger scale. Stipulations could be attached to permits to reduce impacts.

The **Middlecountry Zone** (329,000 acres) allows for cross-country motorized use of OHV weighing 1,000 pounds curb weight and less without permit for winter travel. These seasonal and weight restrictions help reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape, even with cross-country travel allowed, because of the frozen soils and snow cover on lower growing vegetation.

Summer travel by OHVs weighing 1,000 pounds curb weight and less and a width not exceeding 50 inches is allowed on designated trails only. This helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape because travel is limited to hardened designated trails. These management activities help protect the visual resources on 327,000 acres.

The **Frontcountry Zones** (38,500 acres) allows for cross-country motorized use of OHV weighing 1,000 pounds curb weight and less without permit for winter travel. These seasonal and weight restriction help reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape, even with cross-country travel allowed, because of the frozen soils and snow cover.

Summer travel by OHVs weighing 1,000 pounds curb weight and less and a width not exceeding 50 inches is allowed on designated trails only. This helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape because travel is limited to hardened designated trails. These management activities help protect the visual resources on 38,000 acres. In addition, the Table Top Mountain trail, the Ski Loop trail and the Summit trail, are limited to non-motorized use only, which helps protect the visual resources along these trails.

A portion of the Wickersham Trail is closed to OHV use from April 15 to June 1. This closure helps protect visual resources by closing this trail to travel until soils are suitable for travel without resource damage. This management action helps protect visual resources on approximately 28,000 acres.

The Frontcountry Zone also allows for use of highway vehicles and OHVs weighing 1,500 pounds curb weight along approximately 11 miles of mining tailings along Nome Creek. These areas are hardened and show little change from the existing modified landscape. These management actions impact visual resources along these travel areas.

In both the Middlecountry and Froncountry zones, the use of larger vehicles off designated trails may be allowed by permit. Visual resources would be protected through the use of management class objectives and the visual contrast rating process when permits are considered.

Effects from Special Designations

Under Alternative B, 589,000 acres would be designated as the White Mountains ACEC to protect caribou and Dall sheep habitat. Management decisions to protect wildlife habitat would help preserve the visual characteristics of the area. For example, seasonal restrictions or closures of areas to motorized use may occur to protect habitat. Seasonal restrictions on activities within a one mile radius of mineral licks would limit development and use in these areas. The ACEC would be closed to leasable and locatable minerals, and would be a ROW avoidance area. ROW avoidance would protect visual resources by not allowing clearance of vegetation and construction of structures associated with different kinds of rights-of-ways. These actions would help reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape to 589,000 acres.

Impacts to visual resources from RNAs would be the same as Alternative A.

Of VRI Class I lands (39,000 acres) one-hundred percent would be retained under class I management. Of VRI Class II lands, five percent or 25,000 acres would be managed as Class I while seventy-three percent or 403,000 acres would be managed as Class II lands and twenty-two percent or 121,000 acres would be managed as Class III lands allowing some change to the natural landscape.

Under Alternative B, 5,800 acres associated with Fossil Creek would be maintained as a natural landscape under the eligibility as a “scenic” river and would be assigned a VRM Class II to protect the naturalness of the river corridor. “Scenic” rivers are still largely primitive and undeveloped by may contain some development such as roads, trails and minor facilities. Management decisions to preserve these characteristics help to preserve the visual resources of the area by limiting surface-disturbing activities and maintaining natural vegetation and landform.

4.7.1.5.4. Alternative C

In general, Alternative C anticipates a moderate level of resource protection, use and enhancement of resources and adopts VRM classes that would allow a range of development and still protect visual resource in certain areas. Additional impacts beyond those discussed as common to all subunits under section 4.3.1.9 are discussed below.

Effects from Fish and Aquatic Species

There are 14 RCAs identified for accelerated rehabilitation of habitats which include active revegetation and streambank stabilization techniques on 444,000 acres. These activities would have a positive impact to areas with surface disturbance in returning the disturbance to a more natural looking landscape faster than natural revegetation.

Of VRI Class I lands (67,000 acres) one-hundred percent would be retained under Class I management. Of VRI Class II lands, two percent or 6,000 acres would be managed as Class I while twenty-two percent or 263,000 acres would be managed as Class II lands, eighteen percent (152,000 acres) would be managed as Class III lands allowing some change to the natural

landscape and forty-seven percent (177,000 acres) would be managed as Class IV allowing a visible level of change to the landscape. No lands were identified as VRI Class III or IV.

Effects from Visual Resources

Under Alternative C, of VRI Class I lands (seven percent or 70,000 acres), one-hundred percent would continue to be managed as VRM Class I resulting in preservation of the existing visual character of those lands. These lands, the Beaver Creek WSR, have an A rating for scenic quality, high sensitivity and occur in the foreground-middle ground zone.

Additionally, of VRI Class II lands (ninety-three percent or 950,000 acres), approximately three percent (25,000 acres) would be managed as Class I resulting in preservation of the existing visual character of these lands associated with the Beaver Creek WSR Corridor. Approximately twenty-three percent (217,000 acres) of VRI Class II land would be managed as VRM Class II allowing a low level of change, while twenty-eight percent or 268,000 acres would be managed as Class III lands potentially resulting in only partially retention of landscape characteristics. Additionally, forty-six percent or 440,000 acres of VRI Class II lands would be managed as VRM Class IV potentially resulting in a high level of change to the characteristic landscape. These lands have an A rating for scenic quality, a high sensitivity and occur in both the Foreground-Middleground and Background Zones.

Using design fundamentals of proper siting and location, reducing unnecessary disturbance and by repeating the landscape elements of form, line, color and texture for all surface-disturbing activities can contribute significantly in reducing impacts to visual resources, regardless of VRM Class.

Effects from Wilderness Characteristics

Visual characteristics are related to the criteria used to determine the presence of wilderness characteristics which includes naturalness. Management decisions to preserve wilderness characteristics help to preserve the visual resources of the area by limiting surface-disturbing activities and maintaining natural vegetation and landform. Under Alternative C, wilderness characteristics would be maintained on 312,000 acres (thirty-one percent), limiting activities that impact the appearance of naturalness.

Of VRI Class I lands (70,000 acres) one-hundred percent would be retained under class I management. Of VRI Class II lands, ten percent or 25,000 acres would be managed as Class I while ninety percent or 217,000 acres would be managed as Class II lands. No lands were identified as VRI Class III or IV lands.

Effects from Wildlife

Same as Alternative B.

Effects from Forest and Woodland Products

Personal use of timber and commercial timber sales would not be allowed within the Beaver Creek WSR Corridor and the RNAs. Temporary camps and various impacts from different harvest techniques would not impact 82,000 acres. Additionally, commercial use of forest products would not be allowed within the RNAs. Temporary camps and various impacts from different harvest techniques would not impact 12,600 acres. These management actions would help protect visual resources.

The rest of the subunit would be open to personal use of timber, and commercial use of both forest products and timber, potentially impacting visual resources on 935,000 acres. The size and scope of impacts would depend on the size of the area and harvest techniques used. Commercial timber sales are unlikely due to lack of access and lack of commercially valuable timber.

Timber salvage sales would be considered throughout the subunit. The size and scope of impacts would depend on the size of the area and harvest techniques used.

Effects from Land and Realty

No transportation corridors or right-of-way avoidance areas would be identified. The concentration of access roads and other rights-of-way may not occur. However, few rights-of-way are anticipated during the life of the plan within the White Mountains NRA.

Effects from retaining PLO 4176 would be the same as Alternative B.

Effects from Leasable Minerals

Under Alternative C, approximately 100 acres of split-estate lands would be open to fluid mineral leasing. The remainder of the subunit would be closed to both solid and fluid leasable minerals. These actions would protect visual resources.

Effects from Salable Minerals

Impacts would be similar to Alternative A, except less land would be opened to salable minerals. Under Alternative C, impacts to visual resources by production of salable mineral resources on 951,000 acres would depend on the scale of the action and the number of mineral sites. While ninety-three percent of the subunit is open to salable minerals it is anticipated that only 100 acres along roads would be mined within this subunit.

The Beaver Creek WSR Corridor (69,000) acres would be closed. Visual resources would not be impacted by mining salable minerals on these lands.

Effects from Recreation

Recreation Management Zones are managed for different physical settings which include remoteness, naturalness and visitor facilities. Of these, naturalness and visitor facilities impact visual resources by setting prescriptions for management, i.e., describing the amount of naturalness and how facilities will sit on the landscape. These prescriptions range from Primitive, Semi-Primitive, Backcountry, Middlecountry, Frontcountry, Rural and Urban, each with different levels of naturalness and description of how facilities will sit on the landscape.

Of VRI Class I lands (70,000 acres) one-hundred percent would be retained under class I management. Of VRI Class II lands three percent (25,000 acres) would be managed as Class I, while twenty-two percent or 217,000 acres would be managed as Class II, twenty-eight percent or 268,000 acres would be managed as Class III lands allowing some change to the natural landscape and forty-six percent (437,000) would be managed as Class IV lands allowing visual changes to the natural landscape to occur. No lands were identified as VRI Class III or IV lands.

Under Alternative C: the Beaver Creek WSR Corridor and Primitive RMZs would have a VRM Class I (96,000 acres); the Semi-Primitive RMZ (102,000 acres) would have a VRM Class II; the Backcountry RMZ would have a VRM Class III (382,000 acres); and all other lands, including the Middlecountry and Frontcountry RMZs would have a VRM Class IV (440,000 acres).

Effects from Travel Management

Under Alternative C, effects from travel management outside of the SRMA and in Primitive Zones would be the same as Alternative B.

Travel Management within the SRMA

The **Semi-Primitive Zones** (171,000 acres), which includes Beaver Creek WSR Corridor and the White Mountains Highlands, allow cross-country motorized use of OHV weighing 1,000 pounds curb weight and less without permit for winter travel. The season of travel and weight restriction helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape, even with cross-country travel allowed, because of the frozen soils and snow cover on lower growing vegetation.

The **Backcountry Zone** (382,000) allows for cross-country motorized use of OHV weighing 1,000 pounds curb weight and less without permit for winter travel. The season of travel and weight restriction helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape, even with cross-country travel allowed, because of the frozen soils and snow cover on lower growing vegetation. Same as Alternative A, Windy Creek and Fossil Creek drainages are closed to OHV use from April 15 to August 31. This closure helps protect visual resources by closing these drainages within the river corridor to travel from April 15 until the snow melts along approximately 27 miles.

In both the Semi-Primitive and Backcountry zones, the summer use of OHV weighing 1,000 pounds curb weight and less and all use of motorized vehicles greater than 1,000 pounds curb weight may be allowed by permit. The impacts from vehicles would vary depending on the size of vehicle, season of travel, and the number of passes made. They would be similar to impacts described for cross-country travel except on a larger scale. Stipulations could be attached to permits to reduce impacts.

The **Middlecountry Zone** (398,000 acres) allows for cross-country motorized use of OHV weighing 1,000 pounds curb weight and less without permit for winter travel. The season of travel and weight restriction helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape, even with cross-country travel allowed, because of the frozen soils and snow cover on lower growing vegetation.

Summer travel by OHVs weighing 1,000 pounds curb weight and less and a width not exceeding 50 inches is allowed on designated trails only. Travel off designated trails or designated routes will be allowed to retrieve legally harvested game within this zone only. This helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape because travel is limited to hardened designated trails except for game retrieval. Multiple passes over the same travel route for the retrieval of game could cause changes in color, line, and texture on the landscape. Repeated OHV use leads to destruction of vegetation, which in turn results in soil exposure, creating a contrast between the adjacent greens of natural vegetation and the browns and grays of exposed soil and organic materials. A contrast in line occurs when the irregular characteristics of vegetation is altered by a more regular line in the form of a developed route or constructed trail. Texture characteristics change from the natural course or rough textures of diverse vegetation to the smooth uniform texture of a developed trail, trail hardening techniques, or mineral soil area. These management activities help protect the visual resources on 398,000 acres.

The heavier UTVs would be allowed designated trails only. This helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape because travel is limited to hardened designated trails. These management activities help protect the visual resources on 398,000 acres. The use of UTVs off designated trails and all use of motorized vehicles greater than 1,500 pounds curb weight off of roads and outside designated areas may be allowed by permit. Visual resources would be protected through the use of management class objectives and the visual contrast rating process when permits are considered.

The **Frontcountry Zone** (38,500 acres) allows for cross-country motorized use of OHV weighing 1,000 pounds curb weight and less without permit for winter travel. The season of travel and weight restriction helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape, even with cross-country travel allowed, because of the frozen soils and snow cover on lower growing vegetation.

Summer travel by OHVs weighing 1,000 pounds curb weight and less and a width not exceeding 50 inches is allowed on designated trails only. This helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape because travel is limited to hardened designated trails. These management activities help protect the visual resources on 38,500 acres.

The heavier UTVs would be allowed designated trails only and no game retrieval would be allowed. This helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape because travel is limited to hardened designated trails. These management activities help protect the visual resources on 38,500 acres.

In addition, the Table Top Mountain trail, the Ski Loop trail and the Summit trail, are limited to non-motorized use only. A portion of the Wickersham Trail is closed to OHV use from April 15 to June 1. This seasonal closure helps protect visual resources by closing this trail to travel until soils are suitable for travel without resource damage. These management actions help protect visual resources along these trails.

The Frontcountry Zone also allows for use of highway vehicles and OHVs weighing 1,500 pounds curb weight along approximately 11 miles of mining tailings along Nome Creek. These areas are hardened and show little change from the existing modified landscape. These management actions impact visual resources along these travel areas. The use of UTVs off designated trails/areas and other motorized vehicles greater than 1,500 pounds curb weight may be allowed by permit. Visual resources would be protected through the use of management class objectives and the visual contrast rating process when permits are considered.

Effects from Special Designations

Under Alternative C, the White Mountains ACEC would not be designated and Fossil Creek would not be recommended as suitable for inclusion to the National Wild and Scenic Rivers system.

The three designated RNAs would continue, helping to protect visual resources on 12,600 acres. Management of the RNAs would differ from Alternatives A and B. Primitive camping and the construction of hiking trails would be allowed. Visual impacts from trail construction include changes in color, line, and texture on the landscape. A contrast in line occurs when the irregular characteristics of vegetation is altered by a more regular line in the form of a constructed trail.

Texture characteristics change from the natural course or rough textures of diverse vegetation to the smooth uniform texture of a developed trail, trail hardening techniques or mineral soil areas. Most trails would attract attention of the casual observer if viewed from a higher observation point and if the trails were located within the Foreground-Middleground and Background Zones. Trails or routes that are properly designed and viewed from ground level, however, would not generally attract the attention of a casual observer, with the exception from trailhead observation points.

Of VRI Class I lands (1,000 acres) one-hundred percent would be retained under class I management. Of VRI Class II lands, one-hundred percent (12,000 acres) would be managed as Class I. No lands were identified as VRI Class III or IV lands.

Same as Alternatives A and B, the Beaver Creek WSR Corridor would be managed as a VRM Class I.

4.7.1.5.5. Alternative D

In general, this alternative anticipates the greatest amount of resource development and adopts the least restrictive VRM classes that would allow major development while protecting visual resource in certain areas.

Effects from Fish and Aquatic Species

There are eight RCAs identified for accelerated rehabilitation of habitats which include active revegetation and streambank stabilization techniques on 205,000 acres. These activities would have a positive impact to areas with surface disturbance in returning the disturbance to a more natural looking landscape faster than natural revegetation.

Of VRI Class I lands (66,000 acres) one-hundred percent would be managed under Class I resulting in the preservation of the existing visual character of the landscape. Of VRI Class II lands, two percent or 4,000 acres would be managed as Class I, twenty-two percent or 42,000 acres would be managed as Class II lands, while thirty-six percent (68,000 acres) would be managed as Class III lands allowing some change to the natural landscape and forty percent or 75,000 acres would be managed as Class IV lands allowing a visible level of change to the landscape.

Effects from Visual Resources

Under Alternative D, of VRI Class I (70,000 acres or seven percent), one-hundred percent would continue to be managed as VRM Class I resulting in preservation of the existing visual character of those lands. These lands, the Beaver Creek WSR, have an A rating for scenic quality, high sensitivity and occur in the foreground-middle ground zone.

Additionally, of VRI Class II lands (ninety-three percent), less than one percent or 12,000 acres would be managed as VRM Class I resulting in preservation of the existing visual character of these lands associated with the Beaver Creek WSR Corridor. Approximately twelve percent or 123,000 acres of VRI Class II lands would be managed as VRM Class II while thirty-four percent or 321,000 acres would be managed as Class III lands, potentially resulting in only partially retention of landscape characteristics; and fifty-five percent or 494,000 acres would be managed as VMR Class IV lands potentially resulting in a high level of change to the characteristic landscape. These lands have an A rating for scenic quality, a high sensitivity and occur in both the Foreground-Middleground and Background zones.

Using design fundamentals of proper siting and location, reducing unnecessary disturbance and by repeating the landscape elements of form, line, color and texture for all surface-disturbing activities regardless of VRM Class can contribute significantly in reducing impacts to visual resources.

Effects from Wilderness Characteristics

Visual characteristics are related to the criteria used to determine the presence of wilderness characteristics which includes naturalness. Management decisions to preserve wilderness characteristics help to preserve the visual resources of the area by limiting surface-disturbing activities and maintaining natural vegetation and landform. Under Alternative D, wilderness characteristics would be maintained on 205,000 acres (twenty percent), limiting activities that impact the appearance of naturalness.

Of VRI Class I lands with wilderness characteristics (70,000 acres) one-hundred percent would be managed under Class I resulting in the preservation of the existing visual character of these lands. Of VRI Class II lands with wilderness characteristics, nine percent or 12,000 acres would be managed as Class I while ninety-one percent or 123,000 acres would be managed as Class II lands. No lands with wilderness characteristics were identified as VRI Class III or IV lands.

Effects from Wildlife

Same as Alternative B.

Effects from Forest and Woodland Products

Effects under Alternative D would be the same as Alternative C, except personal use of timber would not be excluded from the Beaver Creek WSR Corridor and the RNAs, increasing the potential for impacts in these areas. The size and scope of impacts would depend on the size of the area and management restrictions required.

Effects from Land and Realty

Same as Alternative C, no transportation corridors or ROW avoidance areas would be identified, resulting in potential impacts to visual resources.

Under Alternative D, a portion of PLO 4167 on Perhaps Creek would be revoked. This revocation would allow 200 acres to be transferred out of BLM management and open for development and associated surface disturbance activities.

Effects from Leasable Minerals

Approximately 569,000 would be closed to leasable minerals, including the RNAs, the Primitive RMZ, Beaver Creek RMZ, Highlands RMZ, Cache Mountain RMZ, Nome Creek RMZ, Wickersham/Blixt RMZ, the Perhaps Creek recreational withdrawal, and all disposal lands. These actions would protect visual resources by not allowing surface disturbance activities associated with leasable mineral development.

Approximately 451,000 acres in the Foothills Middlecountry RMZ would be open to leasable minerals subject to minor constraints, such as seasonal restrictions. Additionally, 100 acres split-estate lands would be open subject to standard stipulations. Although almost half of the subunit would be open to leasable minerals, no exploration, leasing, or development is anticipated

due to the low development potential for the area. Impacts to visual resources by the development of fluid leasable minerals are described under Impacts Common to All Subunits.

Effects from Salable Minerals

Same as Alternative A.

Effects from Recreation

Recreation Management Zones are managed for different physical settings which include remoteness, naturalness and visitor facilities. Of these, naturalness and visitor facilities impact visual resources by setting prescriptions for management, i.e., describing the amount of naturalness and how facilities will sit on the landscape. These prescriptions provide a range from Primitive, Semi-Primitive, Backcountry, Middlecountry, Frontcountry, Rural and Urban, each with different levels of naturalness and description of how facilities will sit on the landscape.

Of VRI Class I lands (70,000 acres) one-hundred percent would be retained under class I management. Of VRI Class II lands, one percent or 12,000 acres would be managed as Class I, thirteen percent (123,000 acres) would be managed as Class II, while thirty-four percent or 321,000 acres would be managed as Class III lands allowing some change to the natural landscape and fifty-two percent (490,000 acres) would be managed as Class IV lands allowing a visible level of change to the landscape. No lands were identified as VRI Class III or IV lands.

Under Alternative D: the Beaver Creek WSR Corridor and Primitive RMZ would have a VRM Class I (82,000 acres); the Backcountry RMZ would have a VRM Class III (445,000 acres); all remaining lands including Middlecountry and Frontcountry RMZs would have a VRM Class IV (494,000 acres).

Effects from Travel Management

Under Alternative D, effects from travel management outside of the SRMA would be the same as Alternative B.

Travel management within the SRMA

In all zones, restrictions or closures associated with travel may occur to protect resources. These actions would improve visual resources by restricting or eliminating damaged to vegetation and clearing of trails.

Primitive Zones (RNAs) are closed to OHV use. This helps protect visual resources by preventing surface disturbance to vegetation and soils from motorized vehicles on 12,600 acres.

The **Semi-Primitive Zone** (69,000 acres), which consists of the Beaver Creek WSR Corridor, allows cross-country motorized use of OHV weighing 1,000 pounds curb weight and less without permit for winter travel. The season of travel and weight restriction helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape, even with cross-country travel allowed, because of the frozen soils and snow cover on lower growing vegetation.

The **Backcountry Zone** (445,000 acres) allows for cross-country motorized use of OHV weighing 1,000 pounds curb weight and less without permit for winter travel. The season of travel and weight restriction helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape, even with cross-country

travel allowed, because of the frozen soils and snow cover on lower growing vegetation. In addition, Windy Creek and Fossil Creek drainages are closed to OHV use from April 15 to August 31. This closure helps protect visual resources by closing these drainages within the river corridor to travel from April 15 until the snow melts along approximately 27 miles.

The summer use of OHV weighing 1,000 pounds curb weight and less and all use of motorized vehicles greater than 1,000 pounds curb weight within the Semi-Primitive and Backcountry zones may be allowed by permit. Visual resources would be protected through the use of management class objectives and the visual contrast rating process when permits are considered.

The **Middlecountry Zone** (452,000 acres) and the **Wickersham Dome-Fred Blixt Frontcountry RMZ** (7,500 acres) allows for cross-country motorized use of OHV weighing 1,000 pounds curb weight and less without permit for winter travel. The season of travel and weight restriction helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape, even with cross-country travel allowed, because of the frozen soils and snow cover on lower growing vegetation.

Similar to Alternative A, cross-country summer travel by OHVs weighing 1,000 pounds curb weight and less and a width not exceeding 50 inches is allowed. Multiple passes over the same travel route could cause changes in color, line, and texture on the landscape. Repeated OHV use leads to destruction of vegetation, which in turn results in soil exposure, creating a contrast between the adjacent greens of natural vegetation and the browns and grays of exposed soil and organic materials. A contrast in line occurs when the irregular characteristics of vegetation is altered by a more regular line in the form of a developed route or constructed trail. Texture characteristics change from the natural course or rough textures of diverse vegetation to the smooth uniform texture of a developed trail, trail hardening techniques or mineral soil area. Limiting by weight, helps protect the visual resources on 460,000 acres.

The heavier UTVs would be allowed on designated trails only. This helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape because travel is limited to hardened trails. These management activities help protect the visual resources on 460,000 acres. The use of larger vehicles may be allowed by permit.

Same as Alternatives B and C, a portion of the Wickersham Trail is closed to OHV use from April 15 to June 1. This closure helps protect visual resources by closing this trail to travel until soils are suitable for travel without resource damage. This management action helps to protect visual resources on approximately 28,000 acres.

The **Nome Creek Frontcountry Zone** (31,000 acres) allows for cross-country motorized use of OHV weighing 1,000 pounds curb weight and less without permit for winter travel. The season of travel and weight restriction helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape, even with cross-country travel allowed, because of the frozen soils and snow cover.

Summer travel by OHVs weighing 1,000 pounds curb weight and less and a width not exceeding 50 inches is allowed on designated trails only. This helps reduce the amount of surface disturbance to vegetation and soils with resulting changes to line, form, color and texture of the natural landscape because travel is limited to hardened trails. These management activities help protect the visual resources on 31,000 acres.

UTVs would be allowed on designated trails only and no game retrieval by UTV would be allowed, helping to reduce the amount of surface disturbance and resulting changes to line, form, color and texture of the natural landscape because travel is limited to hardened trails. These management activities help protect the visual resources on 31,000 acres.

Several trails are limited to non-motorized use only and the use of highway vehicles is allowed on approximately 11 miles of mine tailings along Nome Creek. Impacts would be the same as Alternatives B and C.

Effects from Special Designations

Same as Alternative C.

4.7.1.6. Wilderness Characteristics White Mountains Subunit

Summary of Effects

There are 1,014,500 acres identified within the White Mountains Subunit as having wilderness characteristics of size, naturalness, and the opportunity for solitude or a primitive unconfined type of recreation experience. Managing lands for wilderness characteristics would not allow for many surface-disturbing activities. See section 4.3.1.10 Impacts Common to All Subunits. Alternative B would protect the most acres for wilderness characteristics while Alternative A would not identify any acres as having wilderness characteristic. Alternative C provides a balance between protection and resource use while Alternative D provides for resource development and protects the least amount of land for wilderness characteristics.

4.7.1.6.1. Alternative A (No Action)

No lands are managed for wilderness characteristics under this Alternative. Of the 1,014,500 acres identified as having wilderness characteristic, none would be directly managed to protect those values. Other actions and management strategies may help protect those values indirectly, such as managing for a Primitive or Semi-Primitive recreation setting. All lands with wilderness characteristics are currently withdrawn from mineral entry, so no mining-related impacts to wilderness characteristics would occur.

4.7.1.6.2. Alternative B

Of the 1,014,500 acres identified as having wilderness characteristic, 509,000 acres (fifty percent), would be directly managed to protect those values. Other actions and management strategies may help protect wilderness values indirectly on the remaining 505,463 acres. All lands with wilderness characteristics are currently withdrawn from mineral entry, so no mining-related impacts to wilderness characteristics would occur. Approximately 951,000 acres would be open to salable minerals however the reasonably foreseeable development scenario does not suggest a high percentage of development during the life of the plan. Even if all development is realized it would affect much less than one percent of all available acres. Development of recreational facilities and travel management in Middlecountry and Frontcountry RMZs would also impact wilderness characteristics in localized areas.

4.7.1.6.3. Alternative C

Of the 1,014,500 acres identified as having wilderness characteristic, 312,000 acres (thirty-one percent), would be directly managed to protect those values. Other actions and management strategies may help protect wilderness values indirectly on the remaining 702,500 acres. All lands with wilderness characteristics are currently withdrawn from mineral entry, so no mining-related impacts to wilderness characteristics would occur. Approximately 951,000 acres would be open to salable minerals however the reasonably foreseeable development does not suggest a high percentage of development during the life of the plan. Even if all development is realized it would affect much less than one percent of all available acres. Development of recreational facilities and travel management in Middlecountry and Frontcountry RMZs would also impact wilderness characteristics in localized areas.

4.7.1.6.4. Alternative D

Of the 1,014,500 acres identified as having wilderness characteristic, 205,000 acres (twenty percent), would be directly managed to protect those values. Other actions and management strategies may help protect wilderness values indirectly on the remaining 890,500 acres. All lands with wilderness characteristics are currently withdrawn from mineral entry, so no mining-related impacts to wilderness characteristics would occur. Available acres for leasable minerals are 451,000 and 1,020,000 acres would be open to salable minerals. The reasonably foreseeable development scenario does not suggest a high percentage of development during the life of the plan and no leasable mineral exploration or development is anticipated. Even if all development is realized it would affect less than one percent of all available acres. Development of recreational facilities and travel management in Middlecountry and Frontcountry RMZs would also impact wilderness characteristics in localized areas.

4.7.1.7. Wildlife White Mountains Subunit

Summary of Effects

There are only a few major changes in the management proposed in Alternative C from the current management (Alternative A). There would be a slight increase in area in which summer OHVs would be allowed (and the larger UTVs would be allowed on some trails), but summer OHVs would be limited to designated trails (except for game retrieval) so the overall effects of OHVs on wildlife and habitats would be considerably reduced. Commercial timber sales would be allowed (except within the Beaver Creek WSR Corridor and Primitive Areas) but is not expected to occur. The designated Wildlife Conservation Area would have relatively little effect in Alternative C, given the other management decisions in this alternative (e.g., the area of the Wildlife Conservation Area is already closed to mineral entry and leasing and summer OHV use), but does add more definitive language minimizing impacts to Dall sheep use of mineral licks and applies Wildlife Conservation Area-specific ROPs. Monitoring snowmobile use of Dall sheep and non-forested caribou habitat and adjusting management if necessary will reduce potential future impacts. Alternative C would have slightly lower impacts to wildlife than Alternative A, but somewhat more than Alternative B. Impacts to wildlife would be greatest under Alternative D.

In addition to the effects discussed in section 4.3.1.12 Impacts Common to All Subunits, Wildlife, the following impacts would occur in the White Mountains Subunit.

4.7.1.7.1. Effects Common to All Alternatives

Effects from Locatable Minerals

In all alternatives, the White Mountains NRA and associated lands contained in the SRMA are closed to mineral location and entry. There are existing mining claims which occur outside of the SRMA in the Livengood area, and placer and lode mining and exploration occurs on those. Mining will therefore only occur on existing claims in the subunit and impacts will be local in nature, primarily in the Livengood area where a large lode mine is being developed, which includes a minority of federal claims.

Effects from Travel Management

Motorized boat usage can result in disturbance of wildlife in and along Beaver Creek. Effects depend on noise levels, frequency and duration. Motorized boats of up to 15 horsepower can be launched from Nome Creek. Use of larger boat motors is not prohibited, but larger boat usage has typically only occurred from three private inholdings on Beaver Creek, limiting potential effects. The horsepower limitation for launching at Nome Creek limits the distance downstream that many boats will travel and then travel back upstream. Greater impacts could occur if use from private inholdings increased greatly, road access to lower Beaver Creek was developed, or technology advances allow easier travel with small motors.

4.7.1.7.2. Alternative A (No Action)

Effects from Wildlife

There is no specific provision to monitor or limit off-trail snowmobile use in caribou habitat, but similar actions could be taken under other provisions.

Effects from Leasable Minerals

There would be no effects as the entire subunit is closed to mineral leasing.

Effects from Recreation

The Primitive Management Unit (575,000 acres) is managed to protect remote, primitive values (Map 44). Use occurs mostly by winter recreationists along the winter trails system, which includes four cabins in the unit, and in the summer by hikers in the upper Nome Creek and Mt. Prindle areas. Summer motorized use occurs on the Quartz creek trail which forms the boundary of the unit in that area. Impacts from recreation in this unit are minor. The Beaver Creek WSR is used mostly by summer float boaters, although motorized use is allowed and occurs mostly by small boats during hunting season in the upper portion. The Semi-Primitive Motorized unit (428,000 acres) is subject to the most recreational use (and variety of types of use).

Effects from Travel Management

Summer OHV use (less than 1,500 pounds GVWR) is allowed throughout the Semi-Primitive Motorized Management Unit (Map 44), although some areas have been closed to reduce or prevent resource damage (Map 57). Cross-country OHV use will continue to increase under this alternative with an increase in number of OHV owners and an increase in the capabilities of machines to readily traverse difficult terrain. Direct loss of habitat will occur from cross-country

OHV use as described in the Vegetative Communities, Effects Common to all Subunits section 4.3.1.8. Sheep use in the area surrounding a mineral lick in upper Little Champion Creek may be hampered by the combined and increasing levels of motorized and non-motorized recreation. Dall sheep could possibly abandon use of the area between Champion Creek and Quartz Creek under foreseeable levels of OHV activity, due to the very scattered nature of small tors for escape terrain. Caribou winter habitats in upper Victoria Creek could be affected by snowmobile use facilitated by trails created in summer by OHV users.

Effects from Special Designations

Mount Prindle, Limestone Jags, and Serpentine Slide RNAs are the only specially designated areas. In Alternative A, no camping is allowed in the RNA (though this has not been enforced) to avoid disturbing research projects. This limits human activities in the areas and limits disturbance of Dall sheep, raptors, and other species. Management of Beaver Creek as a WSR, even though it attracts recreational use, limits impacts to wildlife overall.

4.7.1.7.3. Alternative B

Effects from wildlife

A provision to monitor snowmobile use of non-forested caribou habitat and adjust management if necessary will minimize potential future impacts should use of these habitats increase. An ACEC is designated in this alternative to protect caribou calving/postcalving and Dall sheep habitat.

Effects from Leasable Minerals

Same as Alternative A.

Effects from Recreation

RMZ designation in this alternative manages for smaller changes in the landscape than other alternatives (Map 48). A Primitive Area (White Mountains Spine) is created in this Alternative. A Travel Management plan limiting summer OHV travel to designated trails is the biggest change from current recreation management (see Effects from Travel Management). Effects of recreation to wildlife will be reduced relative to current management in this alternative. The White Mountains Spine Primitive Area is Dall sheep habitat and the upper Victoria Creek drainage (designated Semi-Primitive in Alternative B) contains caribou calving range, caribou winter range, and areas of high-density moose habitat.

Effects from Travel Management

Summer OHV use is allowed in the Frontcountry and Middlecountry RMZs (491,000 acres) but is restricted to a system of designated trails. This restriction will greatly reduce the potential impacts of summer OHVs on wildlife. Off-highway vehicle travel will be limited to a designated subset (approximately 139 miles initially) of existing trails. The total miles of various types of existing trails, from well-established trails to those barely visible, are unknown but probably are much more than the 139 miles of trail to be designated. Trails are sometimes spread widely enough that surface disturbance may better be measured in area than miles. Over time, managed/constructed trails will replace many designated trails not currently under management. These trails can be routed so as to minimize impacts to sensitive wildlife and habitats. Pioneering of new trails will stop and current non-designated trails will begin to recover, dependent on the success in

persuading off-highway vehicle users to remain on designated trails. The area of wildlife habitat influenced by off-highway vehicles will decrease dramatically.

Effects from Special Designations

Designated RNAs are the same as Alternative A and managed similarly. The White Mountains ACEC includes the majority of historical calving habitats of the Fortymile caribou herd and the current calving and postcalving habitats of the White Mountains caribou herd, as well as all Dall sheep habitats. The ACEC is closed to mineral location, entry and leasing and motorized vehicle use will be limited so as to maintain caribou and sheep habitat quality (including portions of a Middlecountry RMZ).

Fossil Creek would be considered suitable for designation as a “scenic” river. Management as a Wild and Scenic River would differ little from that otherwise proposed in this alternative.

4.7.1.7.4. Alternative C

Effects from wildlife

Same as Alternative B except no ACEC would be designated. Instead, the area would be managed as a wildlife conservation area.

Effects from Leasable Minerals

Same as Alternative A.

Effects from Recreation

Relative to Alternative B, this alternative converts some Semi-Primitive RMZ to Backcountry RMZ (Cache Mountain) and some to Middlecountry RMZ (White Mountains Foothills). The latter change increases the area in which summer motorized use is allowed.

This alternative is very similar to Alternative A, except that the Alternative A “Primitive Management Unit” is designated a Semi-Primitive RMZ (Victoria Creek area) and the remainder is designated as Backcountry. Also, an area adjacent to Beaver Creek WSR Corridor is opened to motorized use (becoming Middlecountry) and a portion of Roy Creek drainage is closed to motorized use (becoming Backcountry). This alternative represents very little change from Alternative A, except for the designation of a largely inaccessible area as Primitive and a Travel Management decision to limit OHV use to designated trails (except for game retrieval).

Negative effects from recreation are expected to be lower in Alternative C than in Alternative A, but somewhat higher in Alternative C than in Alternative B. The Backcountry RMZ might be managed to allow more human use than the Alternative A “Primitive Management Unit,” in which case there may be minor additional impacts in those areas. However, with the Travel Management decision to limit summer OHV use to designated trails, potential impacts to wildlife from Middlecountry RMZ management will be greatly reduced relative to Alternative A.

Effects from Travel Management

Summer OHV use on designated trails is allowed in Frontcountry and a somewhat larger Middlecountry RMZ (Map 58) than in Alternative B. Off-trail use will be allowed for game retrieval. This provision may create some of the impacts associated with allowance of

cross-country travel (discussed under section 4.3.1.12 Impacts Common to all Subunits), but those impacts are expected to be relatively very minor. The off-trail use for game retrieval will be very limited and any tracks created will not be typically continued to be used and deepened, as they might in Alternatives A or D. In comparison to Alternatives A or D, the impacts of summer OHV use would be very small in Alternative C. UTVs (larger OHVs) will be allowed on some trails (27 miles) that are constructed to a standard that will allow use with minimal degradation of the trail. UTVs on select existing trails will have little impact. However, trails constructed or improved to support use by large OHVs begin to approach roads in size and design, with relatively larger potential impacts.

Effects from Special Designations

Designated RNAs are the same as Alternative B, but primitive camping is allowed, which may result in slightly greater human activities in the areas and disturbance of Dall sheep, raptors, and other species.

An ACEC for caribou and sheep habitat is not designated in this alternative, but instead a Wildlife Conservation Area is designated. The same management provisions will apply as to the ACEC in Alternative B. The Wildlife Conservation Area is smaller than the Alternative B White Mountains ACEC but includes most Dall sheep habitat and most of the concentrated calving/postcalving area of the White Mountains caribou herd. The portion of the calving/postcalving area which overlapped with the Middlecountry RMZ was not included in the Wildlife Conservation Area and some degradation of wildlife habitat from motorized use is possible, although density of designated trails is not expected to reach levels that would impair use by caribou.

Fossil Creek is not classified as suitable for designation as a “scenic” river in this alternative. This will have minor effect on management during the life of the plan, due to other management provisions.

4.7.1.7.5. Alternative D

Effects from Wildlife

Similar to Alternative C, except there is no specific provision to monitor or limit off-trail snowmobile use in caribou habitat.

Effects from Leasable Minerals

The Middlecountry RMZ (Map 50), nearly half of the subunit, is open to leasing, but only the northwest portion of Victoria Creek drainage is considered to be a high potential zone for leasable minerals. This area includes known winter range for the White Mountains caribou herd and moose habitat supporting a moderately dense moose population. A low mineral potential zone occurs in the Wickersham, Moose, Trail, Roy, and Bear creek drainages. This includes moose habitat of varying moose densities (low to high) and caribou calving/postcalving habitat (mostly north of the Beaver Creek WSR Corridor).

Other portions of the Middlecountry RMZ, although classified as “no potential” for leasable minerals, contain valuable wildlife habitats that could potentially be impacted by mineral exploration or leasing which would be allowed, including Dall sheep habitat in the Quartz Creek/Champion Creek area and a Dall sheep movement corridor in lower Victoria Creek and additional portions of caribou calving/postcalving range. The greatest conflicts with wildlife

would occur in lower Victoria Creek sheep habitat and the area north of Nome Creek and upper Beaver Creek. Disruption of movements between Victoria Mountain and Mount Schwatka and use of a mineral lick along Victoria Creek may occur as a result. Approval of leasing proposals are discretionary, with approval dependent on effects on other resources, and so effects on wildlife species vulnerable to impacts may be mitigated during NEPA evaluation of any proposal.

Effects from Recreation

This alternative has the largest area of Middlecountry RMZ (452,000 acres) and so the greatest area of allowed summer motorized use and increased emphasis on facility development. Relative to Alternative B, this alternative eliminates the White Mountains Spine Primitive Area and the Semi-Primitive White Mountains Highlands RMZ. Relative to Alternative A it will allow motorized use in a large portion of lower Victoria Creek and a relatively small area along Beaver Creek south of Serpentine Slide RNA. Travel management under this alternative will allow cross-country summer OHV use, with impacts of this activity occurring in a greater area. Effects of recreation on wildlife will be higher than all other alternatives. The area of Middlecountry is increased greatly (54,000 to 123,000 acres) and is higher than other Alternatives, and higher than the area of Semi-Primitive Motorized Unit of Alternative A. Impacts would potentially occur to Dall sheep, caribou, moose and other wildlife, primarily in the northern portion of the White Mountains NRA.

Effects from Travel Management

Summer OHV use is allowed throughout Frontcountry and expanded Middlecountry Zones and that use is not restricted to trails. Effects from summer OHV use would be greatest in this alternative. In addition to effects described for Alternative A, opening of Victoria Creek drainage to OHVs could result eventually in a trail to or near lower Beaver Creek, potentially affecting Dall sheep in the area. Similar to Alternative C, UTVs would be allowed on designated trails but, the miles of designated UTV trail will approximately triple (112 miles). This allowance on select existing trails will have little impact. However, new trails constructed to support use by UTVs will have a larger footprint than trails constructed for smaller OHVs.

Effects from Special Designations

The effects from RNAs and WSRs would be the same as Alternative C.

Effects from Wild and Scenic Rivers designation and management are the same as Alternative C. The Wildlife Conservation Area would be smaller under this alternative than under Alternative B. It would protect most Dall Sheep habitats and most of the core (most highly used) White Mountains caribou calving/postcalving habitat. Portions of current White Mountain and historical Fortymile caribou calving/postcalving habitats could be impacted by cross-country summer OHV use in Middlecountry RMZ.

4.7.1.7.6. Cumulative Impacts

In addition to the cumulative effects discussed in section 4.3.1.12 Wildlife, the following cumulative effects would occur in the White Mountains Subunit. The incremental development of more and larger OHV trails and the increasing speeds and capabilities of OHVs will incrementally add to impacts to wildlife in Alternative D. OHV usage has increased greatly in recent years and may increase greater than anticipated in the future. Limiting OHV use to designated trails (Alternatives B and C) will greatly reduce potential impacts. The future use of caribou calving

habitats in the White Mountains by the Fortymile caribou herd could become less likely to occur given development on both BLM lands and state and private lands in the vicinity of the Steese Highway in the Steese Subunit. Potential oil and gas development on Yukon Flats and the access to support it (including adjacent areas of the White Mountains NRA in Alternative D) could impact wildlife populations. R.S. 2477 assertions could influence access in the White Mountains NRA, especially access to Beaver Creek. Increasing mineral development north of Fairbanks, primarily on state and private lands, could result in increased levels of human activities in the White Mountains. As non-native plant populations become more abundant and widely distributed on adjacent lands, especially the highway corridors, their spread to and establishment on BLM lands becomes more likely, especially in conjunction with climate change and in alternatives which allow cross-country OHV use.

4.7.2. Resource Uses

4.7.2.1. Locatable Minerals White Mountains Subunit

Summary of Effects

The White Mountains NRA is withdrawn from locatable mineral entry by ANILCA 1312(b). The remainder of the subunit would be closed to locatable mineral entry under all alternatives. Known high potential areas in the southeastern portion of the subunit would be closed. These minerals and their benefits to society would remain unavailable for the foreseeable future under all alternatives.

4.7.2.1.1. Effects Common to All Alternatives

State-selected lands would remain segregated from mineral entry and location until final land title has been established. New mining operations on withdrawn lands would require a validity exam prior to approval of a Plan of Operation. All active mining operations would be required to submit a Plan of Operation if the 1,000 ton bulk sample is exceeded (43 CFR 3809.11(b)) or if using cyanide in the processing of amenable ores. Mining claim surface occupancy is guaranteed, but must remain reasonably incident to the current levels of mining activity. Bonding is required of all mining operations other than those grandfathered under 43 CFR 3809.300 and 3809.400. Reclamation of surface disturbance would be required. Undue and unnecessary degradation would remain the standard for mining operations on BLM lands. The right of reasonable access across BLM lands to unpatented federal mining claims would be assured. Cultural resources encountered during surface-disturbing activities are subject to the Antiquities Act (43 CFR 3809.420(b)(8)).

The White Mountains NRA is withdrawn from locatable mineral entry by ANILCA 1312(b) and would remain withdrawn under all alternatives. There are known high potential areas in the southeastern portion of the NRA. These minerals, the jobs they create, and their benefits to society would remain unavailable for the foreseeable future.

The portions of the White Mountains Subunit outside the White Mountains NRA, 17,000 acres, is currently closed to locatable mineral through ANCSA 17(d)(1) withdrawals. These areas would remain closed to locatable minerals in all alternatives. There are 4,000 acres of existing federal mining claims near Livengood. No new lands would be made available for the staking of new mining claims or leasing of locatable minerals. The BLM would continue to administer new and existing operations on federal unpatented mining claims through Notices or Plans of Operations. The potential for future exploration and development would be limited to existing

mining claims. Overall mining activity would likely decrease as there are few opportunities to stake new mining claims to offset claim attrition. None of the alternatives would offer a process to address these closures.

4.7.2.1.2. Cumulative Impacts

The only mining that would occur on BLM lands are the existing claims and operations near Livengood. If a large-scale hard rock mine near Livengood becomes a reality, increased exploration on the nearby federal claims would be possible, especially if infrastructure is improved.

Impacts to locatable minerals that are individually minor may cumulatively reduce exploration and production of commodities from public lands. Factors that affect mineral extraction and prospecting include, but are not limited to, such things as permitting and permitting delays, regulatory policy, public perception and concerns, travel management, transportation, mitigation measures, proximity to sensitive areas, low commodity prices, taxes, and housing and other necessities for workers. Many of these issues are issues over which the BLM has no control. Most of these issues result in additional costs or permitting delays that can individually or cumulatively impact projects.

Public lands that currently have no access could reduce the amount of mineral exploration and development that may occur. Mineral resources on non-BLM lands may not be developed if the adjacent public lands are withdrawn from mineral entry as it may not be economically feasible to develop a deposit if only a portion of the deposit is available for development.

Cumulative effects would be the same under all alternatives. This entire subunit would be restrictive to locatable minerals, as existing claims present the only mining opportunity on BLM lands. This further effects the mining community as markets for new commodities have developed, ore deposit theory has advanced significantly, and new mining and milling processes that are less expensive, more efficient and environmentally friendly have been developed since the ANCSA 17(d)(1) withdrawals were enacted in the early 1970s.

4.7.2.2. Recreation White Mountains Subunit

Summary of Effects

Proper resource management, including site-specific measures to protect healthy, functioning watersheds, riparian areas, and associated fish and wildlife habitats, would result in short- and long-term, beneficial impacts to fish and game related recreation use.

Special designations and management applied to these areas, including RNAs, ACECs, and WSRs, would further protect the region, potentially increasing wildlife numbers that benefit wildlife viewing, hunting, and fishing opportunities. Proposed management in ACECs and WSRs would encourage recreation activities of a more non-motorized, Semi-Primitive nature. As the size and scope of these special designations increase, opportunities for non-motorized forms of recreation would also increase. Negative effects from these designations would also arise, if additional restrictions were placed on OHV use and other recreational activities.

The delineation of recreation management areas (SRMA) would protect and enhance recreational resources while encouraging specific targeted outcomes in these areas. Land, water, and snow

based activities would continue to remain the focus in these designations, including the commonly conducted activities of boating and river based recreation, camping, fishing, hunting, gathering of edible plants and berries, hiking and backpacking, hobby mineral collecting, OHV use (both summer and winter), skiing, dogmushing, and other forms of winter recreation.

Alternative C best meets the goal of providing for multiple recreation use, while sustaining the recreation-resource base and other sensitive resource values of the region. Alternative B emphasizes less motorized recreation use in a more primitive setting, while Alternative D offers more motorized recreation use and includes the most acreage for cross-country OHV travel, followed by Alternative A.

Table 4.18. Comparison of Recreation Indicators: White Mountains Subunit

Indicator	Alternatives		
	B (acres)	C (acres)	D (acres)
Special Recreation Management Area	1,016,000	1,016,000	1,016,000
Other BLM-managed lands	4,000	4,000	4,000
Recreation Opportunity Spectrum Class (acres)			
Primitive	26,000	26,000	12,600
Semi-Primitive	483,000	171,000	69,000
Backcountry	140,000	382,000	445,000
Middlecountry	329,000	398,000	452,000
Frontcountry	38,000	38,000	38,000

4.7.2.2.1. Effects Common to All Alternatives

Effects from Cave and Karst

Cave and Karst Resources located in the White Mountains Subunit are within the Limestone Jags RNA. These resources are currently protected through the established RNA. The Limestone Jags RNA does not change throughout the alternatives and would be managed for a Primitive recreational opportunity setting in Alternatives B, C, and D. The recreational niche for the RNA is to remain undeveloped. Motorized use is excluded and limited recreation development is expected. Management of this area would provide opportunities for a primitive recreational experience for visitors to the area.

Effects from Wildlife

Wildlife goals of protecting and enhancing wildlife populations and crucial habitat areas would impact recreation. Through avoidance areas and other restrictions on recreational development (including possible seasonal or timing closures, location changes, and limiting the extent of activities or development), restrictions to address wildlife concerns could make certain projects more costly, more difficult if not impossible to accomplish, or unable to meet recreation management objectives. Healthy wildlife populations would benefit hunting, wildlife viewing, and trapping which are all generally secondary activities in most RMZs. Access restrictions could offset that benefit by limiting participation in those activities. The biggest impacts to recreation from wildlife would be in limiting potential motorized and non-motorized recreational opportunities and possibly limiting further development of the winter cabin/trails program.

The prohibition on the use of domestic goats, sheep, and camelids in Dall sheep habitat, under Alternative B, could impact recreation use by users seeking to use these animals as pack animals

as part of their recreation experience. It is anticipated that this is a small user group and effects would be minimal, but interest has been growing in the lower 48 states.

Effects from Lands and Realty

Impacts or benefits from the lands and realty program would be limited under all alternatives. Few land use authorizations are anticipated in the White Mountains NRA that would not be recreation related. Recreation related authorizations would be consistent with recreation setting prescriptions.

Two transportation corridors are designated in Alternative A, one of these would be retained in Alternative B, and none would be retained in Alternatives C and D. Although the designation of corridors varies across alternatives, effects would not because few rights-of-way are anticipated, other than those for recreation related trails developed by the BLM. Additionally rights-of-way are not precluded outside of the transportation corridors, thus designation of corridors in Alternatives A and B would not prevent future approval of rights-of-way in other parts of the White Mountains NRA.

Effects from Locatable Minerals

There would be no effect from locatable minerals on recreation. Entry for locatable minerals is currently closed and would remain so in all alternatives. Although there are valid existing claims in the Livengood area that may be developed, these affect only 4,000 acres, surrounded by state lands. Recreational use of these lands is minimal due to ongoing mineral exploration. Over the long-term, these lands are not likely to remain under BLM management.

Effects from Recreation

Under all alternatives, management actions would continue to provide for multiple recreation uses, including a wide-range of structured opportunities that produce specific targeted outcomes (such as activities, experiences, benefits, and settings). Beaver Creek WSR (111 miles) would continue to be managed to preserve and enhance resource values. Approximately 1,016,000 acres in the White Mountains NRA and adjacent facilities (e.g., Fred Blixt Cabin, Cripple Creek Campground, and trailheads) would be managed to enhance and promote recreational opportunities. Together, these actions would directly affect recreation management by ensuring that land and water based recreation opportunities continue to exist.

Special Recreation Permits would continue to be issued as appropriate for commercial, competitive, and special event use, allowing managers to provide for safe and enjoyable recreation opportunities at fair and allowable levels. This would minimize user conflicts while ensuring that recreation activity levels do not negatively impact the recreation-resource base and other sensitive resource values of the region.

Opportunities for both developed and dispersed recreational use would exist in all alternatives. Current developed recreation sites would continue to be managed to enhance recreation experiences, provide for health and safety issues, and to help mitigate other possible resources at risk. The entire subunit would remain open to dispersed camping, except in areas where specific restrictions or exclusions are in place to meet other resource objectives. Under all alternatives, winter use (October 15 to April 30) of snowmobiles would be allowed, providing opportunities for recreational users during winter months. During the summer months, all forms of non-motorized

use would generally be allowed, except to protect specific resource values, preserve public safety, and maintain identified recreation opportunities.

Effects from Travel Management

Under all alternatives, travel management actions would continue to provide for a range of motorized and non-motorized recreation experiences, while protecting resource values and minimizing user conflicts. This comprehensive approach to travel management would allow the BLM to sustain and enhance recreation opportunities and experiences, visitor access and safety, and resource conservation of the subunit throughout all alternatives. All forms of non-motorized use would be allowed, providing users with opportunities for float boating, hiking, biking and horseback riding. Winter use (October 15 to April 30) of snowmobiles would be allowed except in RNAs (12,600 acres), providing opportunities for recreational users during the winter months. The use of aircraft would also be allowed, subject to reasonable provisions to protect the values of the Beaver Creek WSR and designated RNAs.

4.7.2.2.2. Alternative A (No Action)

Effects from Forest and Woodland Products

Effects of forest products on recreation are expected to be minimal. Under Alternative A, the White Mountains NRA is open to all forest products except commercial timber. Possible impacts that could occur would primarily be to the visual quality. Interest in harvesting would most likely occur along roads and at recreational sites like campgrounds and cabins. Unless properly stipulated and managed for, issuance of permits for timber or forest products could significantly impact certain recreational sites and recreation setting prescriptions such as naturalness. The issuance of permits for forest products, such as berries and mushrooms, to commercial pickers could also impact recreational users of that resource. This impact would most likely only occur in readily accessible areas frequented by the recreational users, such as Nome Creek valley.

Effects from Leasable Minerals

There would be no effects from Leasable Minerals as the entire subunit is withdrawn from mineral leasing.

Effects from Salable Minerals

No effects from salable minerals are expected. Although the entire NRA is available, demand for and reasonable access to material sites in the White Mountains Subunit is very limited. Currently some BLM lands outside the NRA may not have the same protection from development as lands inside the NRA.

Effects from Recreation

Effects would be the same as those discussed under the Effects Common to All Alternatives above. Although the existing Steese RMP (BLM 1986a) did not specifically identify any SRMAs, the BLM essentially manages the White Mountains NRA and Beaver Creek WSR Corridor as a SRMA. Facility enhancements (e.g., cabins, trails, trailheads, and toilets) may be added to accommodate increasing recreational demand. All public lands outside this SRMA would be managed for custodial recreation actions only, and would result in few if any, recreational improvements.

Effects from Travel Management

In addition to those effects discussed under the Effects Common to All Alternatives above, the following effects would occur. Summer motorized travel within the White Mountain NRA and associated lands would be open to use of vehicles 1,500 pounds GVWR and less, except in Primitive and Semi-Primitive non-motorized zones and in other administratively closed areas. Allowing this level of continued OHV use would not address resource and user conflict issues and could result in additional emergency closures to protect the recreation resource base and other sensitive resource values of the region. These actions could result in long-term detrimental impacts to scenic viewsheds that enhance the quality of recreational experiences for other recreation users. Thus, while this alternative would offer greater allowances for recreational activities that involve the use of motorized travel, including hunting and ATV riding; fewer opportunities would exist for recreational users seeking a primitive, non-motorized type of experience.

Effects from Special Designations

The Beaver Creek WSR (111 miles) would continue to be managed to preserve and enhance its resource values, providing long-term, beneficial impacts to those recreation users seeking land and water based recreation activities in the region. Three designated RNAs totaling 12,600 acres, Serpentine Slide, Limestone Jags, and Mt. Prindle, would be managed for a Primitive setting in all alternatives. This would allow for unique undeveloped recreational opportunities. If use increased to a high enough level that resource damage occurred, affected areas could be closed to recreational use or some limited development (particularly trail construction) may need to occur.

4.7.2.2.3. Alternative B

Effects from Wilderness Characteristics

Maintenance of wilderness characteristics on 509,000 acres (fifty percent) would help ensure that opportunities for a primitive and unconfined recreation experience would remain available for present and future recreation users. Maintenance of wilderness characteristics does not eliminate the ability to develop facilities such as trails or cabins though the process will be more stringent as to need, how they are located, that they blend in to the natural landscape, and that the development does not change the experience defined in the RMZ.

Effects from Forest and Woodland Products

There would be no effects under this alternative. The White Mountains SRMA would be closed to all forest uses and lands outside the SRMA (4,000 acres) are mining claims.

Effects from Leasable Minerals

Same as Alternative A.

Effects from salable Minerals

No effects would be expected. The Primitive, Semi-Primitive, and Backcountry RMZs (649,000 acres) would be closed to salable minerals and any sales in the remaining areas would be discretionary. More protections would be afforded BLM-managed lands within the SRMA than under Alternative A.

Effects from Recreation

Effects would be similar to those discussed under the Effects Common to All Alternatives above. Additionally, the BLM would continue to manage the Whites Mountains SRMA (1,016,000 acres) under Alternative B. The remaining BLM lands (4,000 acres) would be managed for custodial recreation only. This alternative adds the use of Benefits Based Management to set prescription settings and delineate RMZs. The SRMA would include seven different RMZs (Map 48) representing five different ROS settings including: Primitive (26,000 acres), Semi-Primitive (483,000 acres), Backcountry (140,000 acres), Middlecountry (329,000 acres), and Frontcountry (39,000 acres).

When compared to the other alternatives, a much greater portion of the SRMA would be reserved for Semi-Primitive experiences of non-motorized use. Facility and other development could be limited to maintain Semi-Primitive setting prescriptions. These management decisions would affect recreation by providing high-quality recreation opportunities for those users who desire an experience characterized by solitude, tranquility, and self-reliance. Motorized users could experience some displacement with potential motorized closure areas or increased restrictions.

Effects from Travel Management

Under Alternative B, few impacts would be expected to occur within the Primitive, Semi-Primitive, and Backcountry RMZs. Within these zones, travel allowances and restrictions would be similar to those currently in place under Alternative A. The primary effects of travel management on recreation would be in the Middlecountry and Frontcountry RMZs (367,000 acres) where new restrictions to motorized use would occur. Motorized use in these zones would change from unlimited cross-country travel by OHVs weighing 1,000 pounds curb weight and less during summer months to the same machines being limited to designated trails. Although most summer OHV use occurs on trails that would be designated for use, OHV opportunities for cross-country uses, including exploring and hunting, would become unattainable. On the other hand it is expected that fewer impacts would occur to soil, water, and vegetative resources, which should in return enhance scenic viewshed qualities and other non-motorized recreational opportunities.

Effects from Special Designations

Under Alternative B, effects from RNAs and management of Beaver Creek WSR would be the same as Alternative A except that Outstandingly Remarkable Values (ORVs) of Beaver Creek would be identified as scenic, recreation, geologic, fisheries, and wildlife. Identification of ORVs would enhance management of Beaver Creek and provide long-term, beneficial impacts to those recreation users seeking land and water based recreation activities.

One eligible river segment, Fossil Creek, would be recommended as suitable for designation as a "scenic" under the Wild and Scenic Rivers Act. If it were designated by Congress, the effect of its inclusion into the NWSR would ensure the protection and enhancement of the outstanding and remarkable scenic and geologic values for which it is identified, providing long-term, beneficial experiences for those individuals seeking scenic and natural landscapes and wanting to experience adventure.

Approximately 589,000 acres would be designated as the White Mountains ACEC to protect caribou and Dall Sheep habitat. This ACEC designation would maintain or protect wildlife habitat, potentially increase wildlife numbers that have beneficial impacts on wildlife viewing and hunting. Negative effects of ACEC designation may also result, if additional restrictions are placed on OHV and other recreational activities.

4.7.2.2.4. Alternative C

Effects from Wilderness Characteristics

Maintenance of wilderness characteristics on 312,000 acres (thirty-one percent) would help ensure that opportunities for a primitive and unconfined recreation experience would remain available for present and future recreation users. Maintenance of wilderness characteristics does not eliminate the ability to develop facilities such as trails or cabins though the process will be more stringent as to need, how they are located, that they blend in to the natural landscape, and that the development does not change the experience defined in the RMZ. The area identified to maintain wilderness characteristics is largely outside the current development of cabins and trails.

Effects from Forest and Woodland Products

Same as Alternative A except all timber harvest including personal use would be prohibited on 82,000 acres within the Beaver Creek WSR Corridor and the RNAs. The harvest of special use forest products such as berries and mushrooms would be allowed everywhere except RNAs. Visual impacts from timber harvest could occur in all RMZs except Beaver Creek and the RNAs potentially threatening the setting prescriptions.

Effects from Leasable Minerals

Same as Alternative A.

Effects from Salable Minerals

Under Alternative C, only the Beaver Creek WSR Corridor (69,000 acres) would be closed to development of salable minerals. Development of salable minerals in any of the Primitive, Semi-Primitive, or Backcountry RMZs could have a considerable impact on the setting prescriptions for these RMZs. It is unlikely that any development would occur, however, based on past interest, the lack of BLM lands along the highways, and the lack of reasonable access.

Effects from Recreation

Effects would be similar to those effects discussed under the Effects Common to All Alternatives above. This alternative is very similar to Alternative A, with the addition of utilizing Benefits Based Management to set prescription settings and delineate RMZs. As in Alternative B, the White Mountains SRMA (1,016,000 acres) and other BLM managed lands (4,000) acres would be identified. The SRMA would include seven different RMZs (Map 48 and 49) representing five different ROS settings including: Primitive (26,000 acres), Semi-Primitive (171,000 acres), Backcountry (382,000 acres), Middlecountry (398,000 acres), and Frontcountry (39,000 acres).

A shift has been made, from Alternative B, away from Semi-Primitive towards more Backcountry and Middlecountry setting prescriptions. The effect of this shift would allow for a slightly higher level of modest site and facility development to enhance recreational opportunities. Through these recreational enhancements some displacement of traditional non-motorized users could be expected, but on the other hand both motorized and non-motorized recreational use, in general, would be expected to benefit from developments or improvements. Use would be expected to increase and a more moderate level of attainment anticipated for experiencing solitude, tranquility, and personal challenge and risk-taking.

Effects from Travel Management

Under Alternative C, the impacts from travel management on recreation would be nearly the same as Alternative B with a few exceptions. These exceptions would include allowing off-trail travel for the retrieval of legally harvested game within the Middlecountry and Frontcountry RMZs (438,000 acres), with the same weight restrictions as in Alternative B, and allowing the use of somewhat larger UTV type vehicles on two trails where they are currently restricted (Map 58). These changes would greatly increase the ability of hunters to utilize the White Mountains for those recreational purposes. The ability to use the UTV type vehicles even on two trails would significantly increase the range of allowed motorized opportunities. As in Alternative B, it is expected that by generally limiting summer cross-country travel by OHVs, fewer impacts would be expected on soil, water, and vegetative resources; and helps maintain the scenic quality of viewsheds and opportunities for non-motorized recreational activities.

Effects from Special Designations

Under Alternative C, the effects from RNAs would be the same as Alternative A. Effects from management of Beaver Creek WSR would be the same as Alternative B. No White Mountains ACEC would be designated under Alternative C. Although no ACEC would be designated, decisions for management of wildlife common to all action alternatives and habitat protections afforded by the designation of the White Mountains NRA under ANILCA, would protect wildlife resources, benefitting wildlife related recreation.

4.7.2.2.5. Alternative D

Effects from Wilderness Characteristics

Maintenance of wilderness characteristics on 205,000 acres (twenty percent) would help ensure that opportunities for a primitive and unconfined recreation experience would remain available for present and future recreation users. Maintenance of wilderness characteristics does not eliminate the ability to develop facilities such as trails or cabins though the process will be more stringent as to need, how they are located, that they blend in to the natural landscape, and that the development does not change the experience defined in the RMZ. The area identified to maintain wilderness characteristics is largely outside the current developed area except for Beaver Creek WSR.

Effects from Forest and Woodland Products

Same as Alternative C.

Effects from Leasable Minerals

Impacts to recreation from leasable minerals could potentially occur. Approximately forty-four percent of the SRMA would be opened to mineral leasing. The area to be opened is the White Mountains Foothills Middlecountry RMZ (451,000 acres). The niche for this RMZ is to provide for winter recreation opportunities through a more highly developed cabin/trail system. Desired outcomes include escaping social pressures and crowds, and enjoying scenery and natural landscapes. Development of leasable minerals could affect these desired outcomes by diminishing them. No exploration or development of leasable minerals is anticipated, however, during the life of the plan due the low development potential for these minerals.

Effects from Salable Minerals

Effects would be the same as Alternative C, except that Beaver Creek WSR Corridor (69,000 acres) would be open to salable minerals.

Effects from Recreation

Effects would be similar to those discussed under the Effects Common to All Alternatives above. As in Alternative B, the White Mountains SRMA (1,016,000 acres) would be identified and Benefits Based Management would be used to set prescription settings and delineate RMZs. The White Mountains SRMA would consist of six different RMZs representing five different ROS settings including: Primitive (12,600 acres), Semi-Primitive (69,000 acres), Backcountry (445,000 acres), Middlecountry (452,000 acres), and Frontcountry (39,000 acres).

Under Alternative D, the only lands managed for Primitive and Semi-Primitive experiences would be the Beaver Creek RMZ and the RNAs. The Primitive and Semi-Primitive settings would be reduced by fifty to sixty percent compared to Alternative C. The long-term effects of Alternative D would allow more significant recreational development in the northern part of the SRMA. The omission of the Highlands Semi-Primitive RMZ and the fifty percent reduction in size of the Primitive RMZ would not be expected to have any real impact on non-motorized type recreational opportunities since very few are occurring now and little more would be forecast in the future. With both Middle- and Backcountry RMZs covering the northern portion of the SRMA future cabin and trail development could offer a much expanded version of the current cabin and trail system.

Effects from Travel Management

The effects of Travel Management on recreation would be fairly similar to Alternative A with a few exceptions. In Alternative D, summer cross-country travel by ATVs would be allowed in the Middlecountry RMZs (451,000 acres), with vehicles weighing 1,000 pounds curb weight or less. Alternative A also allows for cross-country travel with similar restrictions, but the size of the Middlecountry RMZ in Alternative D, in which cross-country use can occur, increases by about five percent. New portions of the northern and northwestern White Mountains SRMA would be opened to limited cross-country travel. In addition, UTV type vehicles would be allowed on numerous designated trails within the Middle and Frontcountry RMZs. Opportunities for motorized activities would be greatly enhanced. These decisions could potentially diminish the recreational experience of users seeking a primitive, non-motorized type of outing. Impacts to soils, water, and vegetative resources could also affect both motorized and non-motorized winter recreational use by leaving certain trails rutted and in poor condition. Depending on use levels and degradation of natural resources, additional closures for summer OHV use could be put in place for specific trails or areas.

Effects from Special Designations

Same as Alternative C.

4.7.2.2.6. Cumulative Effects

The effects of past, present and future actions, including the demand for recreational use, changes to the landscape as a result of surface-disturbing activities, and area closures or restrictions for resource protection, could affect recreation management in the White Mountain Subunit. Implementing any of the alternatives would not contribute to a significant cumulative change to recreational opportunities on public lands.

The demand for recreational use in the subunit is anticipated to increase by ten to fifteen percent over the life of the plan, due to general population increases and increases in recreation-related technology. This use would occur for both motorized (such as OHV use, including snowmobiles) and non-motorized (such as hiking, backpacking, hunting, float-boating, river-based recreation, camping, fishing, and gathering of edible plants and berries) activities, resulting in an increase in resource damage and conflicts among recreationists involved in these activities.

Surface disturbances resulting from forest sales and unmitigated OHV use could cumulatively affect recreational users if activities were concentrated in heavily recreated areas and if activities overlapped in duration. Effects to recreation as a result of these cumulative effects may include the potential dislocation of wildlife for hunting and viewing purposes, and/or the alteration of scenic viewsheds. These effects would be greatest in Alternatives A and D and lower or minimal in Alternatives C and B.

Special designation, including ACECs and WSRs, would further protect the White Mountains Subunit, by maintaining healthy populations of wildlife that benefit wildlife viewing, hunting, and fishing opportunities. As the size and scope of these areas increase in Alternatives B and C, opportunities for land- and water-based recreation uses that incorporate scenic viewsheds as part of the experience would also increase. As areas that require special management attention, however, to prevent irreparable damage to historic, cultural and scenic values, the need for additional restrictions could limit OHV use and other recreational activities.

4.7.2.3. Travel Management White Mountains Subunit

Summary of Effects

Transportation and travel management affects the number of users able to reach and travel on public lands. The primary cause of effects on or changes to the transportation network is resource protection. Measures that are implemented to protect natural resources, such as wildlife, water, and soil could result in seasonal or permanent route restrictions or closures. Permitted activities on BLM-managed lands, such as those related to minerals, could slightly expand the route network.

Alternative C would best manage travel, roads, and trails to provide access and recreational opportunities, while minimizing resource impacts and user conflicts. Alternative B is most restrictive to OHV use. Alternatives A and D have the most potential for resource impacts because of fewer limits to OHV use. Table 4.19, "White Mountains: Comparison of OHV Designations" identifies the indicators that were used to analyze effects on transportation and travel management under each alternative.

Table 4.19. White Mountains: Comparison of OHV Designations

Area Designation	Alternative							
	A		B		C		D	
	Acres	%*	Acres	%*	Acres	%*	Acres	%*
Year-round								
Undesignated	4,000	<1	0	0	0	0	0	0
Open	0	0	0	0	0	0	0	0
Closed	12,600	1	12,600	1	12,600	1	12,600	1
Limited	1,004,000	98	1,008,000	99	1,008,000	99	1,008,000	99
Winter (October 15 through April 30)								

Area Designation	Alternative							
	A		B		C		D	
	Acres	%*	Acres	%*	Acres	%*	Acres	%*
Limited: Cross-country use of vehicles 1,500 pounds GVWR and less allowed in Alt, A, 1,000 pounds curb weight in Alt B, C, and D.	1,004,000	98	1,008,000	99	1,008,000	99	1,008,000	99
Summer (May 1 through October 14)								
Limited: Cross-country use of vehicles 1,500 pounds GVWR and less allowed in Alt, A, 1,000 pounds curb weight in Alt B, C, and D.	440,000	44	4,000	<1	4,000	<1	464,000	46
Limited: Designated routes, weight & width	0	0	367,000	36	437,000 ^b	43	31,000 ^b	3
Limited: Closed to summer OHV use	563,000	55	636,000	62	566,000	55	514,000	50

*Percent of BLM lands within the White Mountains Subunit (1,020,000 acres)

^bOff-trail retrieval of legally harvested game allowed

Table 4.20. White Mountains: Miles of trails

Trail Limitations	Alternative			
	A (miles)	B (miles)	C (miles)	D (miles)
Designated ATV (summer)	cross-country travel allowed	139 miles	139 miles	cross-country travel allowed
Designated UTV (summer)	0	0	27	112
Winter Trails Closed to Summer OHV use	109 miles	117 miles	117 miles	117 miles

4.7.2.3.1. Effects Common to All Alternatives

There would be no effects to Travel Management from locatable minerals, and effects from Cave and Karst Resources and leasable minerals would be negligible. These programs are not analyzed further.

Effects from Travel Management

There are approximately 230 miles of existing BLM-managed trails within the White Mountains NRA. All BLM lands are required to be designated as Open, Closed or Limited to OHV use. No areas would be designated as Open within the White Mountains Subunit under any alternative. Limited designations would restrict motorized vehicles to either weight (Alternative A); width, weight, and designated routes (Alternatives B and C); or, width and weight (Alternative D). A Closed area designation would prohibit motorized vehicle travel year long. The term “summer use” refers to the period of time between May 1 and October 14. Effects would vary depending on how much a trail is used, the level of restriction placed on the trail, and whether the trail is wet or dry during a particular time of the year. Seasonal restrictions could be placed on particular trails to minimize damage to the trail.

Under all alternatives, non-motorized travel (e.g., pedestrian, equestrian, and mechanized uses such as mountain bikes) would continue on all of the BLM lands in the subunit (1,020,000 acres). There would be no change from current management, and opportunities would continue for visitors who access public lands by foot, horse, or bicycle.

Over-snow motorized travel (snowmobiles) would remain limited by weight and width on 1,008,000 acres of the subunit, maintaining opportunities for visitors who travel by these modes of transportation on over ninety-seven percent of the White Mountains NRA. In Alternatives B, C, and D, the weight restriction changes from 1,500 pounds GVWR to 1,000 pounds curb weight. The nomenclature changes essentially result in no change to the size and type of vehicles allowed, but is easier to determine, curb weight is typically more available within the manufacturers specifications, and is in line with rules imposed by the State of Alaska. Cross-country travel by snowmobiles is allowed under all alternatives, but is generally restricted to October 15 through April 30 when adequate snow covers the ground. The only areas closed to snowmobile use are the RNAs (12,600 acres) in all alternatives (Map 57). These RNAs are mostly inaccessible to snowmobiles regardless of designation.

Fixed-wing and helicopter access will remain largely unregulated on all the BLM lands within the subunit unless specifically addressed through the development of a Recreation Activity Management Plan, ACEC/RNA management plan or through regulation.

Potential exists for minor access roads to gravel pit developments along the Nome Creek Road for maintenance purposes. Future requests for road proposals would be considered on a project-specific basis. If roads were developed, access opportunities for OHV users could increase.

Effects from Special Designations

Under all alternatives, the 111 miles of Beaver Creek WSR, as designated through ANILCA, would continue to be managed as a “wild” river pursuant to the WSR. Management of “wild” rivers, per BLM guidance, would impact travel in Beaver Creek WSR Corridor where the construction of new roads, primitive roads, trails, or other provisions for overland motorized travel would not be permitted (BLM 8351 Manual).

4.7.2.3.2. Alternative A (No Action)

Effects from Wildlife

Under Alternative A, when land use actions are proposed, mitigating measures to avoid or minimize possible adverse effects are developed through the environmental assessment process. This sometimes results, in restriction or alteration of timing, location, and extent of a proposed land use activity in order to avoid or minimize adverse effects. Impacts to travel management include avoiding crucial wildlife habitat areas, as identified, and limiting use to specific timeframes or season of use. Areas currently open to OHV use under Alternative A generally avoid crucial wildlife habitat areas. There is a seasonal closure to motorized use to avoid peregrine falcon nesting areas, although they are no longer listed as threatened. Alternatives B and C are more restrictive to OHV use, and D is nearly the same as A.

Effects from Forest and Woodland Products

Under Alternative A, harvest of timber or other forest products would have a minimal effect on travel management. Forest products are reserved for local use only, no commercial timber harvest is permitted, and personal use of timber is allowed throughout the subunit. On the rare occasions that permits are issued, monitoring is done to ensure that the authorized harvest was not exceeded and that permit stipulations have been followed. Permit stipulations may include winter cutting and movement, maintaining a set distance from waterways, and lopping and scattering slash.

Proliferation of trails or routes could occur from authorization of harvest, resulting in potential temporary closures, but stipulations for winter cutting or walk-in only would limit this impact.

Effects from Lands and Realty

There are two established transportation corridors in the White Mountains NRA (Map 15). Since the Nome Creek Road was constructed, the transportation corridor from Mile 42 Steese Highway appears redundant. There have been no ROW applications, outside of the BLM applying for ROWs on trails, for any specific uses or access and few are anticipated in the future. Acquisition of private lands within the NRA would be pursued if they become available. Lands outside the NRA including Wickersham Dome, the Cripple Creek Campground, the U.S. Creek withdrawal, and the Perhaps Creek withdrawal would remain under BLM's management. Access to one Native allotment and three private inholdings would continue to be addressed through Title XI of ANILCA. Lands and Realty actions under this alternative would have no impact to travel management.

Effects from Recreation

The ROS setting provides a framework for identifying the types of recreation activities that the public might desire, which is directly related to transportation and travel management opportunities in those areas. The ROS setting for Alternative A would maintain approximately fifty percent (494,000 acres including Beaver Creek) of the NRA as Primitive. Under the old definition of Primitive, this area is available for non-motorized opportunities and snowmobiles, 1,500 pounds GVWR and less, in most of the area. The old Primitive class is approximately equivalent to the new Semi-Primitive and Backcountry classes (Table 2.4, "Recreation Setting Decision Matrix for the Eastern Interior Planning Area") Approximately forty-eight percent of the NRA (482,000 acres Semi-Primitive Motorized) is classified as "limited" for motorized opportunities (1,500 pounds GVWR and less) and also allows a wide variety of recreation uses and activities including non-motorized activities. Since travel management decisions are applied to the same management units as the recreation opportunity spectrum, impacts from recreation are expected to be minimal.

Effects from Travel Management

The current OHV designation for the White Mountains Subunit is Limited except for RNAs, which are Closed to OHV use (Map 44). Some trails are managed as non-motorized recreation trails and are closed to motorized use. This benefits non-motorized trail users by providing a place where only non-motorized use is allowed and not shared, but also limits motorized users opportunities to travel in the same areas. Cross-country use of snowmobiles is allowed except in Closed areas.

Effects from Special Designations

Special designations may result in limitations on travel. The RNAs are closed to motorized use. Trails could be constructed outside of the RNA boundary to improve access. Hiking and hunting would be allowed. Impacts to motorized travel would be minimal since most of the RNAs are relatively inaccessible to this use. There would be no impacts to non-motorized travel.

4.7.2.3.3. Alternative B

Effects from Wildlife

Same as Alternative A, but impacts to Travel Management would be greater because summer use of OHVs would be restricted to designated trails and therefore provide less opportunity for motorized use. Winter use of snowmobiles could be impacted by seasonal closures within winter caribou range. Snowmobile use numbers in the winter habitat area are generally very low, so impacts are expected to be low.

Effects from Forest and Woodland Products

Personal use of timber (e.g., house logs, firewood) and commercial harvest of forest and timber products would not be authorized within the White Mountains SRMA (1,016,000 acres). There would be no impact to travel management under Alternative B.

Effects from Lands and Realty

Effects would be the same as Alternative A with the addition of, the BLM would pursue a ROW for the Colorado Creek Trail as it crosses state lands. If the ROW is not granted, access to the Colorado Creek Trail as well as maintenance of the trail would be difficult. Additionally, under Alternative B, the White Mountains ACEC and RNAs would be designated as a ROW avoidance area and only one of the transportation corridors (Nome Creek) would be retained. Effects to travel management would essentially be the same as Alternative A because so few ROW are likely, these additional decisions would have little effect.

Effects from Recreation

The ROS setting provides a framework for identifying the types of recreation activities that the public might desire, which is directly related to transportation and travel management opportunities in those areas. The ROS setting for Alternative B would maintain approximately three percent (26,000 acres) of the subunit as Primitive (closed to motorized use year round). Approximately sixty-one percent of the subunit (483,000 acres Semi-Primitive, including Beaver Creek and 140,000 Backcountry) would be limited to winter use of snowmobiles (1,000 pounds curb weight and less). Approximately thirty-six percent (329,000 acres Middlecountry, and 39,000 acres Frontcountry) would limit summer OHV use to designated trails. Since Recreation Management Zones (RMZs) and Travel Management Zones (TMZs) are delineated with the same boundaries under each alternative and were designed to complement one another, impacts from recreation are expected to be minimal.

Effects from Travel Management

Under Alternative B, the OHV designation for the White Mountains Subunit would be Limited except for Primitive areas, which are Closed (Map 57). Approximately 26,000 acres would be designated as Closed. Similar to Alternative A, some trails would be managed as non-motorized recreation trails and generally be closed to motorized use, including the Summit and Table Top trails. Cross-country use of snowmobiles would be allowed except in Closed areas.

Under this alternative, travel would be restricted to designated trails, as well as by weight and width of the vehicle (Table 4.19, "White Mountains: Comparison of OHV Designations"). A total of 139 miles of trails would be accessible for ATVs weighing 1,000 pounds curb weight and less (Map 57). Travel management decisions under Alternative B would reduce the amount of area allowable to operate an ATV compared to the other alternatives. The designated trails, however, are the same trails and same mileage that have generally existed in the White Mountains NRA for the past 15 or more years. The main difference is that OHVs would be required to stay on the

trail. Proliferation of user made trails should be significantly reduced compared to Alternative A. Additional trails may be designated in the future, increasing available use areas.

Effects from Special Designations

Under Alternative B, 589,000 acres would be designated as the White Mountains ACEC (Map 65) to protect caribou and Dall Sheep habitat. Impacts from ACEC management could include limits on seasonal use of trails and construction of additional trails. Effects from RNAs would be the same as Alternative A.

Fossil Creek (23 miles) would be recommended suitable for addition to the NWSR. Should Fossil Creek be designated, impacts to travel management are expected to be minimal since it would be designated as a “scenic” river and currently has trails and two cabins inside the corridor. The BLM could modify existing trails and develop new trails as needed.

4.7.2.3.4. Alternative C

Effects from Wildlife

Same as Alternative B.

Effects from Forest and Woodland Products

Under Alternative C, personal use of timber and commercial timber sales would not be allowed within the Beaver Creek WSR Corridor and the RNAs, but would be considered in other areas. Timber salvage sales would be considered throughout the subunit. If this use occurred, it could either result in trail development and a benefit to motorized uses, or it could result in degradation of existing trails due to heavy use for access to timber sales areas.

Commercial use of forest products would not be authorized within RNAs (12,600 acres), but would be allowed on the remaining lands. Impacts from this activity are expected to be low based on historical demand and usage. All harvest of timber and forest products fall under a discretionary permit and come with stipulations attached to minimize impacts.

Effects from Lands and Realty

Although no transportation corridors would be retained and there would be no ROW avoidance areas under Alternative C, effects would essentially be the same as Alternative B.

Effects from Recreation

Effects would be similar to Alternative B, except the ROS settings would be slightly different. The ROS setting for Alternative C (Map 49) would maintain approximately three percent (26,000 acres) of the subunit as Primitive (closed to motorized use year round). Approximately fifty-five percent (171,000 acres Semi-Primitive, including Beaver Creek and 382,000 Backcountry) would be limited to winter use of snowmobiles (1,000 pounds curb weight and less). Approximately forty-three percent (398,000 acres Middlecountry and 39,000 acres Frontcountry) would limit summer OHV use to designated trails. Compared to Alternative B, more area would be available for motorized uses under Alternative C. Impacts from Recreation would likely be minimal.

Effects from Travel Management

Under Alternative C, the OHV designation for the White Mountains Subunit would be Limited except for Primitive areas, which are Closed (Map 58). The Closed areas would be the same as Alternative B. Similar to Alternative A, some trails would be managed as non-motorized recreation trails and generally be closed to motorized use, including the Summit and Table Top trails. Cross-country use of snowmobiles would be allowed except in Closed areas. Similar to Alternative B, travel would be restricted to designated trails, as well as weight and width of the vehicle under this alternative. A total of 139 miles of trails would be accessible for ATVs weighing 1,000 pounds curb weight and less.

Alternative C differs from Alternative B in that 27 miles of trails would be accessible for UTVs (Map 58) and OHVs weighing 1,000 pounds curb weight and less would be allowed to travel off trail to retrieve legally harvested game (see definition in Glossary). This alternative allows greater use of ATVs compared to Alternative B and allows the use of UTVs on some developed trails. Proliferation of user made trails should be significantly reduced compared to Alternative A, because ATVs are restricted to designated trails except for game retrieval; trail proliferation could be higher than under Alternative B because of the allowance for game retrieval. Off trail use would be minimal and dispersed resulting in fewer effects.

Effects from Special Designations

Management of RNAs would be the same as Alternative B, except that primitive camping and development of primitive hiking trails would be allowed. This alternative could benefit travel management because trails could be established to provide for easier travel through the RNA and users would be able to camp inside the RNA rather than having to travel greater distances outside the RNA to camp.

4.7.2.3.5. Alternative D

Effects from Wildlife

Same as Alternative A.

Effects from Forest and Woodland Products

Effects would be similar to Alternative C, although more area would be open to both personal and commercial uses of timber and forest products. These activities are discretionary and must be compatible with management of the NRA and other resources. Impacts would be minimized through the permitting process or the activity would be denied.

Effects from Lands and Realty

Same as Alternative C, except the Perhaps Creek recreation withdrawal would be available for conveyance to the State of Alaska. This parcel is surrounded by state land and conveyance would have minimal effects.

Effects from Recreation

Effects would be similar to Alternatives B and C, except the ROS settings would be slightly different. The ROS setting for the Alternative D would maintain less than one percent (12,600 acres) of the subunit as Primitive (closed to motorized use year round). Approximately fifty-one percent (69,000 acres Semi-Primitive, Beaver Creek, and 445,000 Backcountry) would be limited to winter use of snowmobiles (1,000 pounds curb weight and less). Approximately forty-eight

percent (452,000 acres Middlecountry and 39,000 acres Frontcountry) would limit summer OHV use to designated trails. Alternative D would provide the greatest level of opportunity for motorized uses. Impacts from recreation, however, would still be expected to be minimal.

Effects from Travel Management

Under Alternative D, the OHV designation for the White Mountains Subunit would be Limited except for RNAs, which are Closed. The Closed areas (12,600 acres) would be the same as Alternative A, and smaller than Alternatives B and C. Similar to Alternative A, some trails would be managed as non-motorized recreation trails and generally be closed to motorized use, including the Summit and Table Top trails. Cross-country snowmobile use would be allowed except in Closed areas.

Travel would be restricted to weight and width of the vehicle. Cross-country travel, using ATVs, 1,000 pounds curb weight and less, would be allowed. Substantially more miles of trail, 112 miles, would be accessible for UTVs (Map 59). Under Alternative D, Travel Management decisions would greatly increase the amount of area where OHVs can travel and expand the type of vehicles allowed compared to Alternatives B and C. This would create a greater impact on non-motorized travelers.

Effects from Special Designations

Effects from RNAs would be the same as Alternative C.

4.7.2.3.6. Cumulative Impacts

A large number of the trails that exist in the White Mountains NRA and are used in the summer by OHVs were built by prospectors to access or scout claims, by hunters using large tracked vehicles, or by seismic exploration activities; while other trails were constructed for trapping, or access from one village to another. Historically, trails were constructed via the path of least resistance for the vehicles or type of use at the time. These trails were not constructed on the best terrain with the best soils, and may not be sustainable. This will continue to effect travel and transportation management for years to come.

Use of the area has increased substantially since the White Mountains NRA was designated in 1980. Technology has advanced and more people own OHVs than ever before. Recreation use levels are expected to increase due to a ten to fifteen percent increase in population over the life of the plan. Surface-disturbing activities may contribute to route restrictions and alterations as some areas and existing routes and trails become more heavily traveled. New routes could increase access to remote areas that were previously inaccessible by motorized vehicles.

Increasing population would continue to put pressure on the BLM to adequately manage travel and transportation on public lands. Public use of existing routes and trails would continue to increase as population increases. Alaska Department of Natural Resources indicated over 13,800 ATVs registered in Interior Alaska in 2008, which is about twenty-five percent of all ATVs registered in Alaska. These numbers indicate a need for continuing effective transportation and travel management planning throughout the White Mountains NRA and in surrounding areas.

The adjoining lands to the south and west of the White Mountains NRA are managed by the State of Alaska. OHV rules on state lands are different than OHV rules on BLM lands. The State of Alaska Generally Allowed Uses restrict OHVs to 1,500 pounds curb weight and allow

cross-country travel in most areas. This may lead to some confusion to the public. The public may not know that they have entered the NRA and that use restrictions are different, as in Alternatives B and C where OHV use is restricted to designated trails. A proliferation of user-made trails could occur along the management boundaries.

4.7.3. Special Designations

4.7.3.1. Wild and Scenic Rivers White Mountains Subunit

Summary of Effects

Under all alternatives the Beaver Creek WSR will continue to be managed to protect the free-flowing characteristics of the river, water quality and Outstandingly Remarkable Values. Outstandingly remarkable values for Beaver Creek are scenic, recreation, geologic, and fish and wildlife populations and habitat.

Management actions that protect the naturalness of the landscape such as wilderness characteristics, protection of fish and wildlife habitats, protection of vegetation, and recreation management that manages for more primitive experiences will help protect many of the possible Outstandingly Remarkable Values of river systems.

Alternative B is the only alternative where river segments are recommended for inclusion to the National Wild and Scenic River System (NWSR). Fossil Creek is recommended as “scenic” with outstandingly remarkable scenic and geologic values.

4.7.3.1.1. Alternative A (No Action)

Under Alternative A no additional river segments are recommended suitable for inclusion to the NWSR. The BLM would not recommend that Congress designate any river segments. Beaver Creek would continue to be managed to protect water quality, free-flowing characteristics and important river values.

4.7.3.1.2. Alternative B

In general, Alternative B anticipates the lowest level of resource development and is the only alternative where river segments are determined to be suitable for inclusion to the NWSR. The BLM would recommend that Congress designate one segment. This recommendation would influence the Congressional decision and increase the likelihood of permanent legislative protection. Decisions are evaluated for effect on identified Outstandingly Remarkable Values, free-flowing character and water quality.

Through the Wild and Scenic Rivers Inventory (Appendix E, *Wild and Scenic Rivers Inventory*) the BLM has determined which rivers and streams are suitable for inclusion in the NWSR. In the White Mountains Subunit, Fossil Creek was determined to be suitable for designation as “scenic,” with outstandingly remarkable scenic and geologic values. Any segment determined to be suitable must be managed for the protection of its Outstandingly Remarkable Values and free-flowing nature until such time as Congress acts upon the determination finding and either designates the river segment or removes it from consideration. If the segment is removed from

consideration by Congress, the BLM would manage the segment according to the management provisions of the RMP. The determination of suitable is a policy determination.

Effects from Air and Atmospheric Values

Protection and enhancement air resources that would continue to promote visually clear skies and maintain good visibility would protect outstandingly remarkable scenic values.

Effects from Cave and Karst Resources

The protection of cave resources located adjacent to or within the river corridor would protect outstandingly remarkable scenic and geologic values.

Effects from Cultural and Paleontological Resources

Surface-disturbing activities (e.g., site excavation) have the potential to directly and indirectly impact water quality and indirectly impact outstandingly remarkable scenic values.

Effects from Soil, Vegetation, and Water Resources

Management of soil resources, vegetative communities, and watersheds for a properly functioning condition within riparian zones, uplands, wetlands and aquatic areas would directly and indirectly enhance water quality and outstandingly remarkable scenic values.

Effects from Visual Resources

Scenic river segments would be managed as a VRM Class II with the objective to retain the existing character of the landscape. Management activities may be seen but should not attract the attention of a casual observer. Changes may occur but should repeat the basic elements of the surrounding landscape. This would help protect outstandingly remarkable scenic values.

Effects from Wilderness Characteristics

The maintenance of wilderness characteristics would directly protect outstandingly remarkable scenic values, the free-flowing characteristics, and water quality.

Effects from Wildlife

Management of a naturally functioning ecosystem would directly and indirectly protect outstandingly remarkable scenic values and enhance water quality.

Effects from Lands and Realty

Land use authorizations, such as leases and rights-of-way, could indirectly and directly impact outstandingly remarkable scenic and geologic values, directly impact free-flowing characteristics, and indirectly impact water quality if authorized across or along the river segment.

Effects from Recreation

Fossil Creek is located within the Backcountry Cache Mountain RMZ. Some facilities may occur within this RMZ and many visitors may come in groups that average up to seven people. These groups may visit the segment and may impact outstandingly remarkable scenic values through the development of social routes. Facilities may directly impact scenic quality and indirectly

impact water quality, however they would be designed to blend with the surrounding landscape characteristics and to not adversely affect water quality.

Effects from Travel Management

Unrestricted non-motorized travel could directly impact outstandingly remarkable scenic values and water quality with the development of social travel routes. Unrestricted aircraft landings could indirectly impact water quality.

Restricted winter motorized overland travel by OHVs weighing 1,000 pounds curb weight and less could indirectly impact water quality by allowing motorized access to remote areas. Winter OHV use may directly impact outstandingly remarkable scenic values with the development of winter travel routes. Restricted motorized travel could directly and indirectly impact water quality by allowing motorized access to remote areas. Motorized use may directly impact outstandingly remarkable scenic values and indirectly impact outstandingly remarkable geologic values with the development of travel routes.

Effects from Special Designations

Fossil Creek, totaling 23 miles and 5,800 acres, would be recommended for designation to the NWSR. The designation of this river by Congress would provide for greater protection of overall river values and of outstanding remarkable river values specifically. The amount of protection is dependent on the classification of the river segment. Management of suitable rivers would be coordinated with the State of Alaska.

Designation and management of 589,000 acres as the White Mountains ACEC would also protect outstandingly remarkable scenic and geologic values in Fossil Creek and directly enhance water quality due to limitations and restrictions to development.

The management of Limestone Jags RNA would also protect outstandingly remarkable scenic and geologic values because of its designation as a right-of-way avoidance area and closure to off-road vehicles and camping. These management actions would also directly and indirectly enhance water quality.

Effects from Hazardous Materials

Environmental remediation activities such as the removal of surface or buried wastes from abandoned sites and removal of contaminated soils could enhance directly and indirectly water quality and outstandingly remarkable scenic values depending on the location of these activities.

4.7.3.1.3. Alternative C

Under Alternative C, no additional river segments are identified as suitable for inclusion in the NWSR. The BLM would not recommend that Congress designated any additional river segments.

4.7.3.1.4. Alternative D

Same as Alternative C.

4.7.3.1.5. Cumulative Impacts

Past, present and reasonably foreseeable actions that are relevant to Wild and Scenic Rivers management include increases in motorized use on both water and adjacent lands, utility and transportation rights-of-way, recreation use, travel management, and use restriction to protect wildlife, fisheries and vegetative resources.

Cumulative effects will accrue from BLM management decisions in addition to activities on surrounding lands during and beyond the life of the plan. Much of the land surrounding the White Mountains is either state lands or other federal. State lands are generally subject to resource development activities which may have a direct impact on water quality and other river related values. Development of lands along waterways could have an indirect impact on other rivers by increasing the importance of river related values of free-flowing, water quality, scenic, recreation, geologic, fish and wildlife habitats and populations, cultural and historic on those other rivers.

Designation and management of the White Mountain ACEC and maintenance of wilderness characteristics, as well as measures to protect other resource values on adjacent federal lands, would help protect lands within the region. Proposed and current management in these areas would limit development and help maintain a more natural ecosystem with benefits to water quality and other river related values.

Protection of river related values including outstandingly remarkable scenic, geologic and wildlife population and habitat values along the Beaver Creek WSR would continue. No rivers on other agency lands have been identified as having values of eligibility in the subunit. Protection of river related values along the proposed addition of Fossil Creek with outstandingly remarkable scenic and geologic values would continue if designated by Congress. The BLM could implement other means to protect river values if these segments are not included in the system.

4.7.4. Social and Economic

4.7.4.1. Economics White Mountains Subunit

Summary of Effects

An economic effect in the White Mountains Subunit continues to result from recreation oriented activities as a result of population growth in the region. Economic effects due to mining on Non-federal land and existing claims would also continue to be important to the region.

4.7.4.1.1. Effects Common to All Alternatives

In addition to the effects discussed as common to all subunits in section 4.3.3.1, the following effects would occur in the White Mountains Subunit.

Effects from Minerals

Under Alternative A, approximately 100 acres of split-estate BLM would be open to fluid mineral leasing, subject to major constraints such as no surface occupancy. Since the majority of the land in the White Mountains Subunit would be closed to leasing and potential for leasable minerals is low, no exploration, and consequently no effects would be likely to occur under any alternative.

Existing mining and new prospects non-federal land, particularly near Livengood would result in economic benefits to the Fairbanks North Star Borough. However, these would not be a result of BLM decisions in this RMP.

New mining claims would not be allowed, as BLM lands would remain closed to locatable mineral entry under all alternatives. There are, however, existing mining operations on 4,000 acres of valid existing federal mining claims in the White Mountains Subunit, near Livengood. The following discussion is based on activities likely to occur on these existing claims (Stebbins 2009). See section 4.4.4.1.2 Fortymile Subunit, Effects from Locatable Minerals for discussion of the Stebbins model, timeline for new claims, life of mines, and a background discussion of types of economic impacts. Mining activity is predicted to result in large and small-scale placer mining operations and would be the same for all alternatives.

Small-scale placer mining uses a bulldozer, and excavator and a mobile wash plant to excavate and process gold-bearing gravel. In this model, a two-man crew works 12 hours per day, seven days per week, during a 130-day season. The camp includes one support person and a cook; a total of four workers. Three small-scale placer mines are currently operating with employment of about 12 workers.

Large-scale placer operations utilize excavation equipment larger than the small-scale model. In this model, 2 two-man crews moving material each work a 10-hour shift, seven days per week, during a 130-day season. Five additional employees, including a supervisor, skilled workers, and laborers; a total of nine workers are included in the model. Assuming one large-scale placer mine, the resulting employment is about nine workers.

The total mining employment on BLM lands would be estimated at 21 part-year workers. Data prepared by the State of Alaska uses full-time equivalents. The full-time equivalent in the White Mountain Subunit would be approximately seven workers, based on the Stebbins (2009) models. Total employment by the Alaska minerals industry in 2008 was 3,392 full-time equivalent jobs (Szumigala et al., 2009) This indicates less than one percent of the industry employment on BLM-managed lands occurred at White Mountain operations. The DGGs reported the average monthly wage for mining in Alaska during 2010 at \$8,345. White Mountains operations account for \$758,810 in wages, annualized.

4.7.4.2. Environmental Justice White Mountains Subunit

Summary of Effects

Communities most likely to be effected by any increased activity in the White Mountain Subunit generally do not qualify as environmental justice populations. Minority or low income populations near the subunit may benefit from employment in the recreation industry.

4.7.4.2.1. Effects Common to All Alternatives

Recreation activities would be slightly higher under all alternatives due to population growth in the region. Environmental justice effects to communities in the area may be positive if employment in guiding or associated activities accrues to local populations. Since the majority of the land in this subunit will be closed to leasing and mining no effects are likely to occur under any alternative.

4.7.4.2.2. Alternative A (No Action)

No environmental justice effects.

4.7.4.2.3. Alternative B

No environmental justice effects.

4.7.4.2.4. Alternative C

No environmental justice effects.

4.7.4.2.5. Alternative D

The number of Special Recreation Permits would be slightly higher under Alternative D than in any other alternative. Environmental justice effects to communities in the area may be positive if employment in guiding or associated activities accrues to local populations.

4.7.4.3. Social Conditions White Mountains Subunit

Summary of Effects

Most impacts to individuals and groups are minor to moderate in part because other opportunities exist for the activities within the planning area on nearby State of Alaska or a Native corporation lands. While it is possible for impacts of multiple resources to adversely affect individuals and groups in a cascading fashion, nearby communities exhibit sufficient resiliency to adapt to change.

All individual programs would have minimal net positive or negative effect to social conditions and are not analyzed further. For further discussion, see Effects Common To All Alternatives in all Subunits.

4.7.4.4. Subsistence White Mountains Subunit

Summary of Effects

Primary impacts on subsistence resources and uses in the White Mountains Subunit would be from decisions on recreation and travel management. Impacts include user conflicts, displacement of resources, and potential declines in resource availability due to disturbance in critical habitats or during critical times (e.g., calving periods). Alternative D, which allows the most latitude to OHV use, would have the highest negative impacts on subsistence. Alternative B, which limits use of OHV the most, would confer the highest levels of protection to subsistence resources and uses. Where permits for summer use of OHV are required, such as in Semi-Primitive and Backcountry Recreation Management Zones, residents participating in federal subsistence opportunities would need a permit for summer OHV use. The permit requirement would be considered a “reasonable regulation” under ANILCA Title VIII Section 811(b).

Alternative B includes designation of the White Mountains ACEC to protect caribou calving and post-calving habitat and Dall sheep habitat. The additional protection of these habitats would benefit subsistence resources. Many resource decisions, such as those for soil, water, air, wildlife,

Special Status Species, and fish, would benefit subsistence resources (section 4.3.3.4 Impacts Common to All Subunits Subsistence.)

Little or no subsistence fishing occurs on BLM-managed lands in the White Mountains Subunit. In general, land use activities permitted in the area, such as development of transportation corridors and salable mineral deposits, may affect water quality at downstream locations, fish spawning or rearing areas and indirectly impact subsistence fisheries harvested off BLM-managed lands. Stipulations to mitigate impacts to water quality and fish spawning and rearing areas are attached to land use permits. No rights-of-way applications other than those from the BLM, however, have been received and it is anticipated that none would occur over the life of the plan. The NRA is closed to all locatable mineral entry. Several acres of valid existing mining claims would continue to be developed around the Livengood area. No impacts to subsistence fishery resources or uses are expected from the alternatives.

Black and brown bear, caribou, moose, furbearers and small game are recognized as subsistence wildlife resources in the White Mountains subunit. Lifetime use of these resources by federally qualified subsistence users is documented by Sumida (1988, 1989). No subsistence use of specific resources on BLM-managed lands within the subunit has been documented; however the Beaver Tribal Council includes the Mt. Schwatka area and a portion of the Victoria Creek drainage in the designated subsistence area for Beaver (Sumida 1989). Historically, bands in the Birch Creek village area moved seasonally into the White Mountains to harvest caribou and sheep and to Birch Creek, the Yukon River and many lakes and creeks to harvest fish, moose, waterfowl and other resources (Caulfield 1983) (Maps 107 and 108). Little or no use of subsistence wildlife resources has been documented by other qualified users. Measures to mitigate the impacts of land use actions on subsistence resource would be attached as stipulations to the authorizing documents. Minimal impacts to subsistence resources or uses would occur from decisions in any of the alternatives.

Some land use decisions under the alternatives would impact vegetative communities and indirectly impact subsistence fish and wildlife resources harvested off BLM-managed lands. These are discussed under the resource uses in the following sections. Forest resources on BLM-managed lands may also be impacted however little or no use of subsistence use of wood or forest products occurs on BLM-managed lands in this subunit.

Subsistence resource availability and opportunity have declined in many areas across the planning area and subsistence use may increase in the subunit over the life of the plan.

4.7.4.4.1. Effects Common to All Alternatives

Effects from the alternatives in the White Mountains Subunit, based on reasonably foreseeable subsistence activity in the subunit, are common to all alternatives.

Effects from Forest and Woodland Products

Decisions for the management of forest and woodland products vary widely over the four alternatives for the White Mountains Subunit. Little documented subsistence use of resources occurs in the subunit. Requests for free-use permits for personal use have been rare and no requests for free-use permits for subsistence harvest have been documented over the past 20 years. Timber within the area is not considered marketable due to the remote location of stands of suitable trees. No impacts to any subsistence resources or uses are anticipated from the management decisions for forest and woodland products.

Effects from Land and Realty Actions

Disposal or acquisition of lands would have minimal beneficial impacts to subsistence resources. Rights-of-way, other than those for BLM trails, are not likely to occur within the White Mountains NRA. BLM proposed trails would be analyzed, at the project level, and measures to mitigate impacts would be attached to authorizing permits.

Effects from Leasable Minerals

No impacts would occur to subsistence uses or resources from oil and gas exploration, drilling, development or related activities in the White Mountains Subunit. Due to lack of high potential oil and gas resources on BLM lands and proposed closures, no activity is expected. Any exploration that might be proposed would require a permit and impacts would be mitigated through permit ROPs and stipulations.

No impacts would occur to subsistence uses or resources from exploration or development of solid leasable minerals or related activities in the White Mountains Subunit. No high potential coal lands occur in the subunit (Map 96) however if coal screening were to be conducted to further determine development potential, development would not occur as leasing has been deferred under this plan.

Effects from Locatable Minerals

The White Mountains NRA is closed to locatable minerals in all alternatives. Approximately 4,000 acres of valid existing claims occur in the Livengood area and have been actively mined for decades. No impacts to subsistence are expected from locatable mineral development in the subunit.

Effects from Salable Minerals

Some or all of the BLM lands in the subunit would be open to disposal of salable minerals in all alternatives. Existing material sites are located near highways, roads or other developments and near the end use. Demand for gravel and other salable materials is predicted to yield additional authorizations over the life of the plan. It is anticipated that most demand would be met on state land. Development of future sites would likely be concentrated near projects, highways and roads and be used locally. Even though effects would likely be limited, site-specific measures to protect healthy, functioning watersheds, riparian areas, and associated fish and wildlife habitats, would mitigate impacts on subsistence resources.

Effects from Recreation

Management of recreation areas through recreation opportunity spectrum (ROS) classes largely set the stage for the level of protection or development afforded an area. The size and location of Recreation Management Zones, and therefore ROS settings change with each alternative and are reflected in the decisions for travel management and related activities. Impacts to subsistence are discussed under these other resource uses.

Effects from Travel Management

The White Mountains Travel Management Plan decisions, and therefore impacts to subsistence, vary widely across the four alternatives. The range of allowed uses includes non-motorized access only, size and weight limits of motorized vehicles, winter cross-country, designated trails, summer

cross-country, permits for other uses and combinations of each. Conflicts between user groups, displacement of wildlife and degradation of fish and wildlife habitat are potential impacts from travel management that would affect subsistence resources and use. However, little subsistence activity by federally qualified subsistence users has been documented in the White Mountains NRA and few resources dependent on the NRA are harvested off BLM lands. Therefore, impacts to subsistence resources and uses from travel management decisions are expected to be minimal.

In areas closed to motorized vehicles, federally qualified subsistence users, subject to reasonable regulation and with a free permit, can use snowmobiles or other means of surface transportation for subsistence purposes as allowed under ANILCA Section 811 (see section 2.4.2.7 Travel Management).

Effects from Special Designations

Under Alternative B, the White Mountains ACEC would benefit subsistence resources and uses because the designation confers additional protection to fish and wildlife values. The ACEC was developed based on areas known to be valuable to fish, wildlife and other resources and the affects would be beneficial to subsistence uses and resources. Although no ACEC is designated in Alternatives C (Map 66) and D (Map 67), similar management would occur on caribou and Dall sheep habitats within Wildlife Conservation Areas to protect these wildlife resources.

4.7.4.4.2. Cumulative Effects

Demand for recreational use is anticipated to increase over the life of the plan as populations in the state increase and technological advancements in recreation equipment occur. Demands for resources important for subsistence may also increase as fish and wildlife resources decline in other portions of the planning area. Conflicts between subsistence and other hunters may increase.

Chapter 5. Consultation and Coordination

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5.1. Specific Consultation and Coordination Activities

The Eastern Interior Draft RMP/EIS was prepared by an interdisciplinary team of specialists from the Eastern Interior Field Office, and the BLM Alaska State Office. Technical review and support were provided by the State of Alaska, BLM Fairbanks District Office and BLM Alaska State Office. Table 5.2, “List of Preparers of the Eastern Interior RMP/EIS” lists the names of individuals involved in preparing this document. Members of the planning team have consulted formally or informally with numerous agencies, groups, and individuals during the planning process. Consultation, coordination, and public involvement occurred as a result of scoping meetings, meetings and briefings with State of Alaska, Tribal, and local government representatives, meetings with interest groups, and individual contacts.

Cooperating agency status provides a formal framework for governmental agencies to engage in active collaboration with a federal agency to implement the requirements of NEPA (42 U.S.C. 4321, et seq.). and state agencies, and local and Tribal governments may qualify as cooperating agencies because of “jurisdiction by law or special expertise” (40 CFR 1501.6 and 1508.5). There are no cooperating agencies on the Eastern Interior RMP. The BLM is working closely with the State of Alaska, but they are not in a formal cooperating agency status. The BLM discussed cooperating agency status with Chalkyitsik Village, but the relationship was never formalized.

The Draft RMP/EIS is consistent with plans and policies of other relevant jurisdictions to the maximum extent possible consistent with federal law and other provisions.

5.1.1. Tribes

In recognition of the government-to-government relationship between tribes and the federal government, 12 federally recognized tribes in or near the Eastern Interior Planning Area were contacted to inform them of the planning process and to request government-to-government consultation. Representatives of tribes were invited to the public scoping meetings held in the planning area. Tribes were contacted a second time near the end of the scoping period. Only the village of Chalkyitsik provided comments in response to these requests for consultation. Letters requesting input on issues and concerns were also sent to Doyon, Limited, the Tanana Chiefs council, and Alaska Native corporations.

The Council of Athabascan Tribal Governments was briefed at their meeting in Fort Yukon on May 14, 2008. Tribal leaders were invited to participate in the planning process through government-to-government consultation. The BLM offered to hold scoping meetings in any villages upon request by the tribes.

A scoping meeting was held in the village of Chalkyitsik at the request of the Tribal government on May 20, 2008. A second meeting with Tribal representatives occurred on November 18, 2008, to discuss the possibility of Chalkyitsik either becoming a cooperating agency or developing a memorandum of understanding on how government-to-government consultation would be conducted during the planning process. Chalkyitsik decided not to become a cooperating agency.

The BLM held a listening session during the time of the Alaska Federation of Natives meeting in Anchorage on October 22, 2008. The Fairbanks District Manager spoke with the Tribal Chair about the Eastern Interior RMP/EIS and cooperating agency options.

On July 8, the BLM met with the Gwichyaa Zhee Gwich'in Tribal Government (formerly the Fort Yukon Tribal Government) to consult and discuss developing a memorandum of understanding on how government-to-government consultation would be conducted during the planning process. This MOU was approved in October 2011.

The Draft RMP/EIS will be available for review by all Tribal entities in the planning area for review and comment.

5.1.2. Intergovernmental

Although no scoping meetings were held specifically for agencies or local governments, the BLM has contacted key federal, state, and local agencies to initiate coordination and collaborative efforts that will continue throughout the planning process. Representatives of various federal, state, and local agencies attended public meetings.

With the high percentage of state lands within the planning area, the BLM has involved the State of Alaska from the beginning of this planning process. A joint BLM-State staff position was created at the Alaska Department of Natural Resources (ADNR), with that person serving as a liaison between the State of Alaska and the BLM. This has worked effectively in facilitating information exchanges and reviews of draft materials by state personnel. The ADNR acts as a state clearinghouse for the BLM by soliciting and coordinating planning input from 15 state agencies. In addition, the ADNR provides technical and consistency reviews of draft documents. The state has both reviewed and provided comments on BLM's draft alternatives and preliminary draft RMP.

The Fairbanks North Star Borough was contacted during scoping and invited to become a cooperating agency as the planning area includes the eastern half of the borough. However, there are very few BLM lands within the borough, and a cooperative agency relationship was not established. Notice of the Draft RMP/EIS was provided to the Borough Planning Department and the cities of Fairbanks and Delta Junction.

5.1.3. Federal Agency

Consultations with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) is required under Section 7 of the Endangered Species Act (ESA), prior to initiation of any project by the BLM that may affect any federally listed or endangered species or its habitat. This RMP/EIS is considered to be a major federal project and thus consultation is required.

The BLM initiated informal consultation with the USFWS in 2008. The USFWS concluded that there were no listed species in the planning area and that further consultation under Section 7 of the ESA is not necessary at this time (USFWS 2008d). In 2011, the BLM consulted with the Yukon Flats National Wildlife Refuge for input into the preliminary Draft RMP/EIS. This Draft RMP/EIS has been submitted to the USFWS for comment.

The NMFS is responsible for the administration of the Endangered Species Act as it applies to listed cetaceans and pinnipeds in Alaska, including seven species of whales and Steller sea lions. The BLM requested a species list from NMFS on March 24, 2008. Since the planning area does not include any coastal areas and is located several hundred miles inland, there are no listed species.

Although no scoping meetings were held specifically for agencies, the BLM has contacted key federal agencies to initiate coordination and collaborative efforts that will continue throughout the planning process. Representatives of various federal agencies attended public meetings.

5.1.4. Interest Groups

The BLM-Alaska Resource Advisory Council (RAC) is a 15-member advisory panel that provides advice and recommendations to the BLM on resource and land management issues in Alaska. Membership includes Alaskans from around the state who represent the energy industry, tourism, commercial recreation, environmental interests, archaeological interests, elected officials, Alaska Native organizations, and the public-at-large. The RAC was kept informed of progress on this plan through briefings at quarterly meetings from 2007–2011. A subgroup was formed under the provisions of the RAC charter to assist the BLM in addressing planning issues for the Eastern Interior planning area.

The Citizen's Advisory Commission on Federal Areas-Alaska (CACFA) is an advisory group to the Governor of Alaska. The commission was initially created after passage of ANILCA in 1980 and operated until 1999, when state funding was eliminated. In 2007, the Commission was reestablished by House Bill 87. The Commission is responsible for identifying potential negative impacts on Alaska and its citizens from federal actions on federal lands. Citizen appointees must represent the diversity of users and uses of federal lands in Alaska. The BLM briefed CACFA on the status of the Eastern Interior RMP at their regularly scheduled meetings.

Several interest groups and individuals formed an Upper Black River Working Group to provide comments and oversee progress on the Eastern Interior RMP/EIS. The BLM met with this group and briefed them on the status of the RMP in February 2009 and January 2010.

5.1.5. Mailing List

Since initial scoping, the BLM has maintained a mailing list of individuals, businesses, special interest groups, and federal, state, Tribal, and local government representatives interested in the development of the Eastern Interior RMP/EIS. All entities on this mailing list were notified of the availability of the Draft RMP/EIS. Copies of the Draft RMP/EIS are also available for public inspection at the following locations:

- BLM Fairbanks District Office, Fairbanks
- BLM-Alaska State Office, Public Room, Anchorage

The Draft RMP/EIS is available electronically online at https://www.blm.gov/epl-front-office/eplanning/lup/lup_register.do. An interactive document is available and comments may be submitted online. Paper or CD copies of the Draft RMP/EIS have been distributed to the organizations, agencies, and individuals who requested them, or as required by regulation or policy.

Concurrent with the distribution of the Draft RMP/EIS, a Notice of Availability is published by the Environmental Protection Agency in the *Federal Register*, marking the beginning of the public comment period. The BLM also published a Notice of Availability in the *Federal Register* announcing the availability of the Draft RMP/EIS for public review and comment.

Notification of the Draft RMP/EIS was provided to the following:

- Federal government agencies (5)
- State government agencies and organizations (6)
- Local governments and committees (10)
- Native corporations (13)
- Tribal governments and committees (15)
- Congressionals (3)
- State Legislators (8)
- Non-governmental organization and businesses (63)
- Other interested/affected individuals (approximately 275)

5.2. Public Outreach

Scoping for the Eastern Interior Draft RMP/EIS was initiated with publication of a Notice of Intent in the *Federal Register* on February 29, 2008. This notice announced the BLM's intent to revise the RMPs for the Steese NCA and White Mountains NRA, to revise the Fortymile MFP, and to develop an RMP for the Black River area. Additional details on public outreach during scoping is included in the Scoping Report (BLM 2008b).

The Eastern Interior Field Office hosted eight public meetings during the scoping period (Table 5.1, "Public Meetings Held During Scoping"). News releases to local and regional media sources advertised the times and locations of these meetings. Agencies and the public were encouraged to submit oral and/or written comments regarding management of public lands in the planning area. Initially, the formal scoping period was to end on July 1, 2008 (approximately 90 days). The scoping period was later extended until August 15, 2008 to ensure adequate time for comment submission. All comments received by September 22 were compiled, reviewed, organized, and analyzed into the Eastern Interior RMP/EIS Scoping Report (BLM 2008b).

Table 5.1. Public Meetings Held During Scoping

Meeting Date	Meeting Location	Number in Attendance
April 10, 2008	Campbell Creek Science Center, Anchorage	11
April 16, 2008	Tok School, Tok	11
April 17, 2008	Delta Junction Community Center, Delta Junction	8
April 22, 2008	Fairbanks North Star Borough Assembly Chambers, Fairbanks	49
May 8, 2008	Red Men Hall, Eagle	11
May 20, 2008	Community Hall, Chalkyitsik	7
May 22, 2008	Steese Road House, Central	9
June 24, 2008	Miner's Hall, Chicken	16

The BLM established the Eastern Interior RMP website in early March 2008. The purpose of this website was to provide the public with information about the planning process, schedule, public meetings, and planning area; to post maps and planning documents as they became available; and, to provide the public with contact information and ongoing status updates on the planning process. The scoping report, summarizing public comment and the results of scoping, was posted in January 2009 on the website. This website can be accessed online at <http://www.blm.gov/ak/>.

The BLM used other available opportunities to inform the public about the Eastern Interior planning process, including flyers and news-letters. Planning flyers were distributed in October 2007 and April 2008. In February 2009, the Eastern Interior RMP newsletter was published and distributed. The Fortymile newsletter also distributed information about the planning process. Two issues of the Fortymile newsletter were published and distributed in June 2007 and June 2009. Information about the planning process was also provided to attendees at the BLM exhibit

booth at the Fairbanks Winter Trade shows in September 2007 and 2008; and the Fairbanks Outdoor shows in April 2008 and April 2009. Additionally, the BLM notified interested parties about the planning process at regularly scheduled meetings for various special interest groups or advisory councils. For example, BLM planning staff presented information on the Eastern Interior RMP process at the BLM-Alaska Resource Advisory Council, the Alaska Miners Association, the Eastern Interior Federal Subsistence Resource Advisory Council, the Yukon River Drainage Fisheries Association, the Upper Black River Working Group, and the Council of Athabascan Tribal Governments meetings and gatherings.

In 2006-2008, the BLM conducted visitor use surveys through the University of Alaska Fairbanks in the White Mountains NRA, Steese NCA, and along the Taylor Highway. The University hosted three focus group meetings to obtain more input between October 23 and November 4, 2008. The results of these studies and meetings helped the BLM to develop a range of recreational opportunities in the planning area.

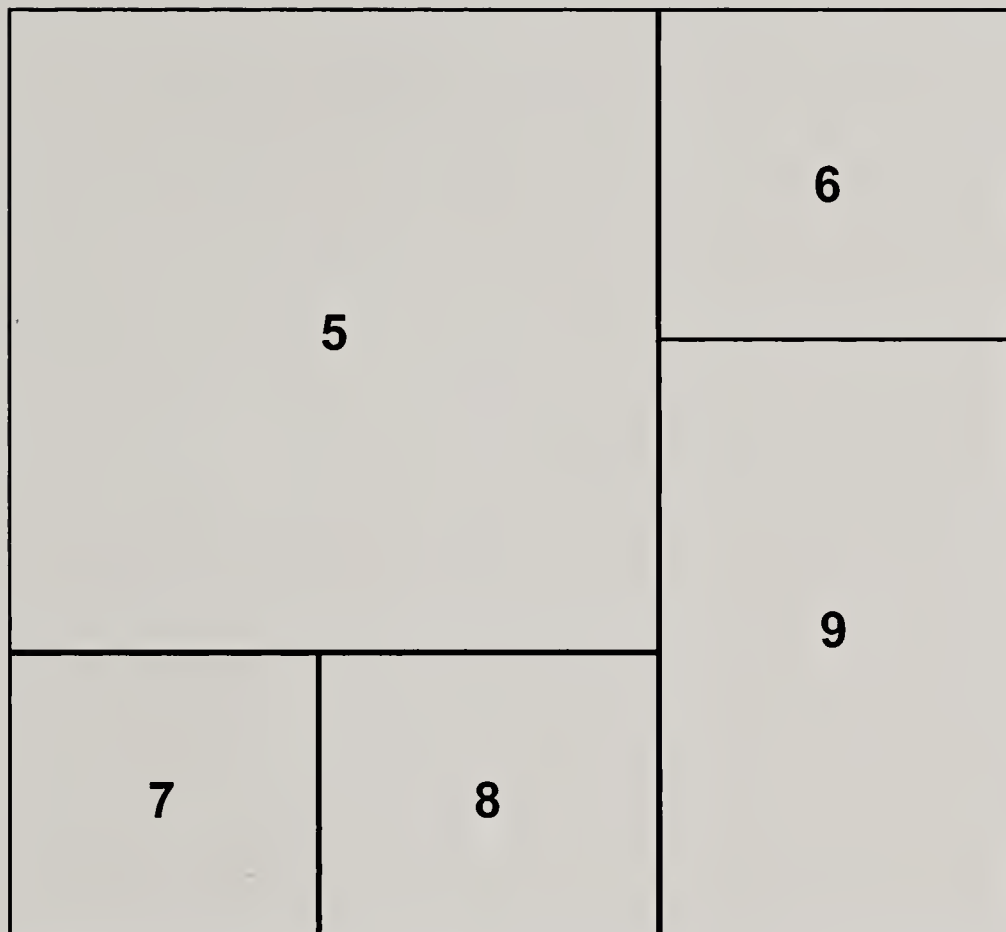
Approximately 400 individuals and interest groups on the mailing list have been notified of the availability of the Draft RMP/EIS.

5.3. List of Preparers

Table 5.2. List of Preparers of the Eastern Interior RMP/EIS

Name	Area of Responsibility	Participation
Rob Brumbaugh	Mineral Potential Reports, RFD, Leasable Minerals	Author
Jeanie Cole	RNAs, Renewable Energy, Grazing, Purpose and Need, Consultation and Coordination	Project Lead, Author
Collin Cogley	Forestry, Recreation White Mountains, and Beaver Creek Wild River	Author
Brad Colin	Recreation and Travel Management, Wilderness Characteristics	Author, Supervisor
Kevan Cooper	Fortymile River, Realty	Author, Reviewer
Tim Dupont	Cave and Karst Resources	Author
Chel Ethun	Recreation, Wilderness Characteristics	Reviewer, Supervisor
Evan Glenn	Travel Management White Mountains	Author
Ruth Gronquist	Subsistence and Non-native Invasive Species	Author
Lenore Heppler	Field Office Manager	Oversight, Supervisor
Jim Herriges	Wildlife, Special Status Species and Vegetation	Author
Rebecca Hile	Hazardous Materials and Abandoned Mine Lands	Author
John Hoppe	Mineral Potential Reports, Locatable and Salable Minerals	Author
Larry Jackson	Minerals	Author, Supervisor
Mike Kasterin	Economics	Author
Ben Kennedy	Soil, Water and Air Resources, Climate	Author
Karen J. Laubenstein and Caron McKee	Editor	Editing and publishing
Holli McClain	Recreation and Travel Management Steese, Wild and Scenic Rivers, Visual Resource Management and Wilderness Characteristics	Author
Ruth McCoard	Public Affairs	Editing, public outreach
Stacie McIntosh	Environmental Justice	Author
Robin Mills	Cultural and Paleontological Resources	Author
Kristin Mull	Fish and Special Status Fish	Author
Darla Pindell	Social Systems	Author
Jason Post	Fish and Special Status Fish	Author

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BLM Back Cover Photos:

- 5. Two caribou bulls running, Steese National Conservation Area, Alaska.
- 6. Checking a set net near the village of Fort Yukon, Alaska. Photo by Alaska Dept. of Fish & Game.
- 7. Arctic Grayling fish assessment, Preacher Creek, Alaska
- 8. OHV rider on the Quartz Creek Trail, White Mountains National Recreation Area, Alaska.
- 9. Sled dogs at Caribou Bluff Cabin, White Mountains National Recreation Area, Alaska.

